

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

FEB. 2, 1953

50 CENTS



TIME WAS when planes landed and took off on uncushioned "skids" or "sled-runners." Some early fliers even tried using bicycle wheels with single-tube bicycle tires cemented to the rims — with unfortunate results. Then Goodyear changed all that.

In 1909, Goodyear developed the first pneumatic aeroplane tire, of the type attached to the sled-runners of the Burgess-Wright biplane shown here. Harry Atwood, the pilot, made this report after his World's Record Long-Distance Cross-Country Flight from St. Louis to New York (15 days): "I was often obliged to land in rough, unfavorable places, but your 20 x 2 inch Wing tire gave me no trouble at all."



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NEWS DIGEST

Domestic

Fairchild Gyro Division, Farmingdale, N. Y., has been awarded a Navy Bureau of Ships contract for design and development of a 25-hp turbine engine. The design of an engine from a turbine engine could enable operation, but some safety observers see a connection with the Navy's development of a developing low speed level propeller. One phase has included use of hydrogen possible fuels.

New York Airways has ordered four new Sikorsky S-55 helicopters, having its first in a total of seven. The new copiers cost \$30,000 each and the company paid an additional \$100,000 for spares.

Yoncos Johnson, Lockheed Westinghouse vice president, was elected president of the Aero Club of Washington last week. Other officers Frank Bowers, Bedford Aviation Corp., first vice president, Public Service, American Aviation, second vice president, Walter Bower, NACA, third vice president, Walter Bower, Aeromedical Training Society, secretary, and Bob Sander, Sander Aviation, treasurer.

A Boeing B-47 Stratojet recently completed 47 simulated combat missions during an 11-day period, flying the equivalent of more than 100 hours around the world in 100 hr.

Forty Fairchild C-119 Flying Boatsmen dropped approximately 400 tons of rice, foodstuffs and other relief supplies in Port Brar, N. C., in the first mass drop of heavy engineering equipment.

Vice Adm. Charles F. Rosenthal (Ret.), vice president of Electric Aircraft Corp., New York, was appointed executive director of the National Air Transportation Coordinating Committee last week.

Aircraft Industries Ass. reports 700 U. S. civil aircraft valued at \$1,977,024 was exported during 1952.

Corvair has posted a 6% wage increase totaling approximately \$1.4 million to all salaried employees at the Fort Worth Division.

Maury J. Pugh, president of Republic Airlines Corp., forecasts an American aviation industry production of



SAFARI WAGON—USAF ground crewmen are shown working on the first local quarter that ended Dec. 11, 1952, completed with \$286,084 earned during the same period in 1951. The company has recently sold a regular quarter divided of 71 months on each of 977,508 common shares outstanding.

14,100 military aircraft in 1953—more than the combined 1951-52 output.

Gen. Nathan F. Twining, Air Force Vice Chief of Staff, was named as expected to begin building new large and larger long range military bomber B-47 for the Air Force, copies of the U. S. 8-33 that new rule on the Soviet Union boundary lines.

Los Angeles International Airport to ports almost high air commerce traffic records were set at the field last year. Record traffic totals for 1952: 2,213,587 passengers, 75,975 aircraft over 1952, 12,158,360 lb. of cargo, up 19,900%, and 11,028,056 lb. of air express, a 12.87% increase.

Proxit Aircraft Co.'s advanced low-fuel steel helicopter rotor blades are being tested by the Navy at Westland, N. C., prior to flight service on the HUP-2 scheduled for next May.

Texas World Airlines has ordered Curtiss-Wright electronic flight duplicator for installation in pilot training system at New York's International Airport and in Canada Field, and at Kansas City, Detroit, Los Angeles and San Francisco.

Financial

Curtis-Wright Corp. reports consolidated net sales last year are est-

imated at \$122 million, nearly double the 1951 total of \$76,025,380.

Northwest Airlines reached a record revenue of \$60,512,076 in 1952 and reached the year with a net income of \$1,631,827 after taxes, preliminary unaudited figures reveal.

Lockheed Aircraft Corp. was awarded price military contracts totaling \$1,123,380,000 from the start of the Korean war to June 18, 1952.

Flying Tiger Line net 41,493,557 increase of domestic freight from 1951, preliminary revenue of approximately \$7 million, compared with \$6,575,800 in 1951.

Aeromarine Corp. reports net earnings after taxes of \$102,881 during the first fiscal quarter that ended Dec. 31, 1952, compared with \$286,084 earned during the same period in 1951. The company has recently sold a regular quarter divided of 71 months on each of 977,508 common shares outstanding.

International

An LAI Italian Air Lines DC-7 crashed in flames last week for South's Steam Mountain 10 min after it had taken off for Rome from Capri's 11th Airport. All 15 passengers and four crew members were killed.

Hawking Group Co. of Great Britain has been awarded a U. S. Air Force contract of more than \$2 million for overhaul of C-47 Dakota transport and Pratt & Whitney engines. Hawking says the contract is the largest of its kind to be placed in Europe.

Venezuelan airports at Maricao, Barinas and Maricao will be at least to accommodate commercial jet airlines, according to government studies now in the final stages.

A twinjet Canberra bomber flew from London to Davis last week in 22 hr and 1 min, setting a new official British-to-Australia speed record. Actual flying time for the 5,400 mi. flight was 20 hr, 1 min. The British bomber previously had set Atlantic speed records.

Aero-Vias, a newly formed Argentinian airline, is scheduled to begin flying 10 Lockheed Lodestar aircraft daily on domestic routes at the start of the current service next August.

Eastern Clashes With United on Aircoach

- **Rickenbacker files formal complaint questioning Patterson's sincerity in challenging safety.**
- **CAB plans to start enforcement action against UAL for operating first-class service at coach rates.**

Civil Aeronautics Board members last week, planned to file a "self-initiated" action against United Air Lines for unfair competition in operating first class service at coach rates in violation of its trust.

Meanwhile, Eastern Air Lines president E. V. Rickenbacker opened the Board to start later by filing a formal complaint questioning the sincerity of United president W. A. Patterson's demonstration of high-class service during seating at coach rates.

"Actually, United's proposal is solely and simply to increase the attractiveness of its coach service by offering some seats to coach passengers," Eastern stated as a complaint and notice that CAB deny United's request to operate first-class (54-seat) DC-6s is at coach fares.

Quoting Council Report-Eastern says United's own policy against the challenge Patterson's allegation that first-class seating is unsafe.

"United's contention is not supported by fact or by law," Eastern says. Eastern, Report No. JA 589-D-1 of Council Aeronautics Laboratory, Inc., an issue made to decrease passenger fares in United's 66-seat DC-6 aircraft pursuant to a contract with United, states... (page 22)

"It was observed that when clatter caused by seat mass, wingtip bags, and blankets played in the aisle did not noticeably affect the evacuation time. The aisle width appeared to be adequate for the orderly movement of passengers toward the exits. Procedures were appeared to be limited only by the speed at which the passengers could get through the hatches or down the aisle."

Quoting Patterson, Sincerely-Eastern adds: "The sincerity of United's concern is in sole words also may be questioned because of its trail proposal which would permit it to limit the number of seats for sale as its 66-seat DC-6s is 54 seats. Such action obviously would not increase the aisle width."

Eastern also points out that the aisle

width in United's DC-6 is "no less than 18 inches, narrower than the aisle in the DC-6s used in first-class service." Eastern concludes that point, challenging: "If United is truly sincere as its concern is to sole width, it obviously should be concerned about the aisle width in its DC-6s."

Eastern then goes into the other "safety" contention of United, that its DC-4 seating capacity should be cut even because of the limited number of emergency exits available. "United's present 66-seat DC-4 aircraft have a total of six exits. Eastern's 54-seat DC-6 coaches have a total of 10 exits. It is apparent that United can do what Eastern has done, namely, remove the number of exits sufficient to permit 66 passengers to evacuate at the same time that 58 passengers can evacuate from United's DC-4s."

• **Ask Wright-Eastern** notes that if a DC-1 with 66-seat seating has two access exits, so have the DC-6 and Continental coaches used by other airlines.

The DC-4 aisle is 18 1/2 in. wide, compared with the aisle for the DC-6 and 14 to 15 in. wide for the Continental seats.

And the aisle in most Continental coaches has only 14 to 16 in. wider than the first-class DC-4. Eastern says:

...the Martin and Goanese (77 in.), DC-6 (30 in.) and Continental (17 in.).

The Eastern complaint argues that United's contention in that... of the number of exits to keep the same, 66 passengers will take more time to evacuate than 58 passengers. "United's solution: 'If United has a safety problem in connection with its 66-seat DC-6 coaches, it can be readily solved by increasing the number of exits, and there is no way to satisfy the Board's air coach policy.'"

• **Ask Policy Change-Lowell**, Eastern's complaint does not go on to ask the Board to modify its coach policy, with regard to the minimum seating of the DC-6 coach, which is presently 68 passengers.

That should be related to some figure compatible with the 79-seat maximum established for the Continental, Eastern says.

The present differential quoted United and National to operate DC-4 coaches with the more luxurious four-wheel seating in competition with TWA and Eastern Continental with its six-wheel seating. Eastern says that once the DC-6 operates a complete air coach.

But it will take a minimum of one year for Eastern and others to put that CAB rule change, because most of the existing airline coaches do not meet this standard, BEI says.

Also, there are some agreements to be offered for the fairness of a 66-seat-sitting DC-6 coach compared with the 54-seat Continental coach.

• **CAB Policy-The Board** set three specific standards for coach-line ac-

may two years ago, for two basic reasons:

• **When the Board** considered making the policy, in the fall of 1991, American Airlines was serving transcontinental 73-seat DC-6 coaches in competition with TWA 81-seat Constellations. The Board policy decision therefore set the minimum past two passengers less than any existing practice. But practically was not the only practice they employed in the decision.

• **CAB compared the direct flight cost of the DC-6 and the Constellation, based on coach seating capacity for the 12 months ended Jan. 31, 1979, for their whole fleets of DC-6s and Constellations-coach and first-class to 17.5 a seat, compared with \$2.66 for the new possible Constellation. Thus, the cost per available seat-mile of the two planes was about equal for a 56-seat DC-6 (3.19 cents) and a 79-seat Constellation (3.68 cents).**

A CAB official therefore concludes that it might be discriminatory for the Board to force DC-6 operators to increase their seating capacity to take advantage of their increased plane, if new airlines prefer to use seat space for providing more luxury at the same cost to competitors.

However, a Board official also says CAB probably would prefer the DC-6 operators continue by selling their full cabin space to lower the fare after sales using it to compete with first-class service.

As to the safety factor, CAB chairman Lowell Cleveland says: "American West's log is the same as Capital's dispute with the Board, not safety. United can cut its seating capacity to fit present, then sell, if the fare is increased enough to compensate for the lost payload. CAB's sole seating authority obligates it to render a decision on economy and fairness of fares for specific services, he said.

• **United to Start DC-6s**-On the day after Eastern filed its complaint, United announced it would start transcontinental 72-passenger DC-6 coach service Apr. 26.

Previously, American Airlines and northeast North American Airlines and Air America had asked CAB for special exemption to fly coach service on United's routes.

The airline they took may have hastened United's decision to change seats to plan to put DC-6 coaches on the Honolulu run first and transcontinental later.

Future plans, United says, "comparable coachline service to Boston, Cleveland, Detroit, and Washington as well as transcontinental service between Los Angeles, which now serves United, coach service to San Francisco and the Pacific Northwest."

Third-Quarter Statistics

Facility	Bridging Net sales in millions of dollars		Net sales during quarter		Ranking Sept. 30, 1992	
	1992	1991	1992	1991	1992	1991
Total	\$14,280	\$2,737	\$1,108	\$1,547	15	15
Complete aircraft parts*	6,041	5,628	569	503	10	10
For U.S. military customers	1,854	1,854	183	227	11	11
Other	967	75	183	877	12	12
Actual aircraft parts*	4,195	786	376	410	13	13
For U.S. military customers	1,889	786	183	227	14	14
Other	179	96	93	183	15	15
Aircraft products & parts	247	74	12	30	16	16
For U.S. military customers	116	48	26	27	17	17
Other	131	26	6	3	18	18
Other products & services	819	130	214	993	19	19

*Excludes Airbus of Canada.

Aircraft Backlog Tops \$15 Billion

Backlogs of aircraft industry orders rose to more than \$15 billion by the end of the third quarter of 1992, survey of aircraft manufacturers revealed last week. The survey included aircraft, engines and propeller products.

A report from the Bureau of the Census and the Department of Commerce, released on Sept. 30, shows that the \$15.457 billion in unfilled orders is 9% higher than reported June 30, end of the second quarter, when they were \$14.938 billion.

Since the end of third quarter 1991, the total backlog has jumped 41%, the report states.

• **Breakdown of Backlog**-Of the total backlog, 50% for complete aircraft, 20% for aircraft engines and parts and 30% represented unfilled orders for propellers and parts.

Major portions of the unfilled orders consisted of new orders for the military. Ninety-two percent of the aircraft backlog, 95% of aircraft engine orders and 95% of propeller orders were military contracts.

During the third quarter of 1992 there were \$1,777 million in new orders, which is 18% of the total backlog. Value of orders during the period was 19% of the unfilled backlog. New orders were compared with orders during the quarter.

New orders for aircraft and parts 140% greater than last quarter, orders for propellers and parts were 140% greater, and aircraft engine orders 21% less than last quarter.

Since subcontractors are reported to the Department of Commerce by both the prime contractor and the subcontractor involved in various contracts, there is some duplication in the figures on value of backlog, new orders and new sales of complete aircraft and parts.

As measured by major subcontractors by the defense manufacturers to other aircraft producers, duplication in the

Comet Lands Short Of Runway In Africa

(By Gene H. Wolf, New)

London-British Overseas Airways' Comet G-15 was caught in a down-draft and landed just short of the runway during a low approach to Entebbe, Uganda, airport in South Africa Jan. 21, the airline captain reports.

As the African Airlines plane killed when struck by the Comet's undercarriage as the plane bounced short of the runway. Passengers and members of the crew were not injured, and the Comet captain quotes many persons aboard the aircraft in saying they did not know anything had happened.

A Ministry of Civil Aviation investigation of the accident is in progress. BOAC is still to appoint the captain's report.

C-15 is at Entebbe while repairs for the damaged undercarriage are flown from Cape Town, but BOAC expects C-15 to return to full duty service in the near future.

United's Rebuttal to EAL

United Air Lines, in a rebuttal to Eastern Air Lines' complaint challenging EAL's sincerity as the coach manufacturer, has asked Civil Aeronautics Board to hold public hearings on the safety problem involved in high-class coach seating.

United also challenged the accuracy of Eastern's comparative data on aisle widths in coach and first-class DC-6s and DC-4s.

United further alleged that doubling the number of emergency exits, as Eastern had done with its DC-4 coaches, would not necessarily speed evacuation procedures. United insists that the amount

on the possibility that some exits might be shut off by fire, and "with that one discrepancy in mind, and as the assumption that availability of some number of exits, therefore, might actually be available in both instances, the [Continental] is not demonstrably that evacuation time increase with increase in the number of passengers."

UAL adds that "each report to East and its subsequent analysis assumes as the number of exits, United's plans do include the installation of an additional exit on its DC-4 coaches," compares United's Eastern analysis of low time exits.

these long used by NACA in various flight research programs, the tubes are made in a discontinuously opposed pair, behind each propeller. The pressure sensed by each pair are averaged before being combined as a single reading on an indicator in the cockpit, showing the thrust being provided by that engine.

► **Fourth Engine**—With an indicator for each engine, the pilot has a positive cockpit indicator as to how each propeller is performing. In the event of an indicator trouble he could tell immediately which propeller was required to a place of his duty.

The dual installation for each propeller is required to avoid excessive single readings in light conditions at pitch or.

Cough pointed out that while the loss of one engine on takeoff would mean the loss of 25% power for a four-engine airplane, an inadvertent reversal on takeoff would mean about a 50% power loss, since the negative thrust of the reversed propeller would partially counteract the positive thrust of the other propellers. Considering this along with stalling characteristics of thrust and the control position in power, the importance of providing an instantaneous indicator of several such dual propellers is almost becomes apparent, Cough pointed out.

More of the test results of indicators mounted in a twin Beech C-45 cockpit, showed indications from pressure tubes mounted at top and bottom of nacelles behind the propellers.

► **Indication**—The measurement, Cough explained, is of the pressure differential between the front and the rear of the propeller disk. From pressure sensing is supplied from the airspeed tube ahead of the propellers.

The cockpit indicator uses made of concentric tapered indicators, modified by changing their scales to show



TYPICAL READINGS from thrust indicators mounted on C-45. The "reverse" reading is obtained when the C-45 took off on reverse propeller installation.

plus and minus thrust measured in inches of pressure.

The various pictures demonstrated how the three indicators show the data in the C-45 (below the power input indicators).

While other devices for indicating engine malfunctions are now being tested by Hercules Standard (Aviation Week Age, 14, p. 58, Nov. 17, p. 76 and Dec. 29, 1952, p. 7), some safety experts suggest that the simple

three gauge system could be avoided without the major operations involved in modifying a propeller's governor and controls and getting CAA approval of the modification. Cough pointed out that the recent three measurements on the C-45 were classified, but not flight tested, since the airplane was available for the first test of the tube and indicators but was not equipped with reversible propellers.

Advisory Board Verdict

The industry and educational advisory board appointed by USAF to monitor AEDC operations passed the following resolution in part: "Resolved, that the board report to December 1953:

- That the board approves the previously expressed opinion that it is in accord with the Air Force policy of operating an AEDC under the direction of a private contractor.
- That the board is completely satisfied with the progress made to date under the organization established to accomplish the Air Force objectives in AEDC.

J. R. Matthews of the Massachusetts Institute of Technology is chairman of the board.

Other members of the organization C. E. Ridenour, president of the University of Tennessee; E. M. Pines, vice president, Curtiss-Wright Corp.; W. H. Pines, engineering manager, Pratt & Whitney Aircraft; A. C. Colwell, vice president, Thompson Products, Inc.; R. G. Bowman, Republic Aviation Corp.; Kenneth Perkins, McDonnell Aircraft Co.; and Susan Rums of Hughes Aircraft Co.

AF Supports Aro in Congress

Top Air Force chiefs recommend that the company be continued as operator of AEDC project.

The Air Force will seek congressional action of a four-year further extension to Aero, Inc. in operation of the Arnold Engineering Development Center. The law will become effective May 31. USAF stated its position in Aero is appropriate to a request from Sen. Albert Gore, leading critic of Aero's participation in AEDC, he said USAF to discuss in making the present status of its plans for operating AEDC after May 31. USAF replied to Gore in a letter signed by Russell H. Colquhoun, Acting Secretary of the Air Force. Copies were sent to Sen. H. Stirling Boggs, chairman of the Senate Appropriations Committee, Sen. W. Stuart Symington, secretary of the Armed Forces Committee and USAF Secretary, when the law enactment was let and Rep. John Tamm, chairman of the House Appropriations Committee.

Gilbert's letter revealed that USAF had decided to support a course of action proposed by L. J. Sverdrup, president of Sverdrup Corp., engineering firm of Sverdrup & Parcel of which Aero is now a wholly owned subsidiary, in full view.

Seek congressional action of the appropriate act restrictions on Aero

► Pending a measurable opportunity for congressional action (from 4 to 6 months) Sverdrup & Parcel will, if requested by the Air Force, operate AEDC on a non-profit basis.

► If final congressional action is favorable, USAF will continue with Aero its continued operation of AEDC as a free mutually acceptable and lesser than any comparable for new being paid by government.

► If congressional action is unfavorable, both Aero and Sverdrup & Parcel will withdraw from any further contact with the operation of AEDC.

Support of Sverdrup's proposed course of action by USAF was evidenced by Capt. Gene James H. Doolittle and Laurence C. Gough "in the interest of securing the best possible operation of AEDC." Doolittle is a member general now serving as a special adviser in USAF Chief of Staff Gen. H. V. Sverdrup. Capt. in Dept. Chief of USAF Staff for Research and Development.

► **Transmission**—Support—General Vandenberg and General Twining (Vice Chief of Staff) believe that the recommendation should be followed; Gilbert notes to Senator Gore "The

active was also discussed by me with Mr. Pennington (then Secretary of the Air Force) who felt that the interests of the new Secretary, Mr. Tamm, should be considered. That I did in the presence of Mr. Spangier, who is to be the new Undersecretary, and it was their opinion that the air staff position should stand."

Captain also detailed USAF explosive of possible alternatives to continued Aero operation of AEDC that were suggested last fall by Senator Gore.

► A non-profit corporation under sponsorship of a leading university USAF considered as it had in previous studies of the alternative, that the type of operation was not available from the standpoint of management and AEDC did not fit into the kind of research arrangement as its organization.

► A government-owned or controlled corporation USAF considered as it had in previous studies of the alternative, that the type of operation was not available from the standpoint of management and AEDC did not fit into the kind of research arrangement as its organization.

► A special legislation would be required before either a government owned corporation such as TVA or a government-owned corporation such as the Federal Reserve Bank could be used.

Also, the object of the type corporation could not meet the requirements that have been consistently applied under the Government Corporation Control Act as decided earlier to carry out a government-owned corporation a government-owned corporation.

► A non-profit contract with either a recognized Aero as a new corporation to be set up by Sverdrup & Parcel, McGraw-Hill, Doolittle and R. G. M. Macdonald, Assistant to the Deputy Chief of Staff, Development for development program, met with Sverdrup & Parcel officials but was rejected at which time L. J. Sverdrup indicated his willingness, although with great reluctance, to consider a contract proposal for a non-profit contract along the lines of the Air Force Engineering Commission arrangement with Management Services Co.

Colquhoun noted that "The board of directors of Aero would be recently established about the time of the bill and Doolittle had met Senator Gore. The understanding involved the proposed addition of several extremely recognized technical experts in aviation to the Aero board of directors.

► **Report Publication**—USAF submitted the specific non-profit contract proposal to Aero last Dec. 28. Regarding this proposal in a meeting with Capt. and Gen. J. E. T. Sverdrup further reported the idea of a non-profit contract with the statement that he and his business associates were now involved in the public opinion, with its assistance, to secure the required non-profit proposal to fundationally acceptable in principle. At that meeting Sverdrup made the counter-proposal which USAF has now agreed to support.

Aro reported that the three additional directors added to the board when USAF requested broadening of its base base, since left the firm (Aviation Week Age, 12, p. 21) They were: Stephen Jackson, David R. Colburn, Jr., and J. Wesley McFadden. These directors were added by Sverdrup & Parcel and sent some added by USAF Undersecretary John McCone as AVIATION WEEK continues reported.

Aro also reported that out of the \$95,000 for on the second AEDC contract, more than \$45,000 was paid in interest and \$50,000 was required to meet expenses, which the government paid in non-reimbursable form. Aro reports it has never paid a dividend to its stockholders and that their three-year "vest" on the AEDC project it has a net position of \$15,000.

Gen. Kenneth's decision on Navy engineering alternatives to Aero plant was made in a meeting of a three-man Research and Development Board committee and occurred before, not after, Aero was represented a contract proposal in Air Force's selection from Aero about three months after it agreed to participate because of USAF's selection to an equipment manufacturer operating test facilities that would be used to test and manufacture equipment.

W. Stuart Symington did not make the decision to award the AEDC contract (Aviation Week Age, 12, p. 21) USAF Secretary, Symington approved a recommendation (which he, Assistant USAF Secretary Herold Stuart that Aero be given the contract).

Engine Failures Hit BOAC Stratocruisers

Twelve of 35 Pratt & Whitney Wasp Major engines taken from British Overseas Airways' Boeing four-engine Stratocruisers was progressing in the engine overhaul and maintenance shop at the airline's grounds in outer 10 plane Stratocruiser fleet to find the cause of recent reported engine difficulties.

A BOAC spokesman in New York said the planes are to begin going back into service Jan. 25 as engine troubles and fuel progress.

► **Engine "Seize Up"**—The airline reported that 15 of the engines "seized up" during a test run on Jan. 25, a few days before, indicating piston was striking because of insufficient lubrication.

Chief Aerodynamics Administrator Richard Curren last week reported that four of the engines had been taken down with the following defects: Two engines showed defective master rods one apparently due to oil starvation. A third engine showed a master valve failure, and a fourth had piston pin plug failure that was believed the cause for failure of metal found in the oil sump.

Inspection of 11 engines not yet taken down disclosed similar metal flakes in all oil sumps.

So far the situation has not established one more definite trend. CAA said, but cannot rule definitely on two engines out of four reported in subject to further check on the basis of findings of other inspections.

When Symington heard of BOAC, announced the decision to ground the entire Stratocruiser fleet Jan. 25 in a result of the engine difficulties. The grounding order was not to be costing \$1,000,000 a day.

► **Panic**—London-based New York BOAC press statement and the facts had been taken to faulty lubrication of engine bearings due to excessive expansion. Lubrication of master rod bearings was disturbed by fuel under certain transient and non conditions the statement reported.

CAA engineers and early inspections was that there has been no need for drastic action in respect to American operated planes governed by similar engines, including Pan American, United and North American Stratocruisers.

Scotland's first new aircraft the four-engine jet engine of similar engines, but BOAC officials discounted the possibility. They pointed out that no single incident had occurred more than one of the affected airlines.

Since BOAC officials expressed belief the groundings might discourage hopes of the airline for a small profit the final vote and make instead in a deficit.



IKE'S PILOT

Mr. William Drepper will pilot the Lockheed Constellation which will be in the final White House plane by President Dwight D. Eisenhower. Drepper is now pilot for former President Truman.



How Tornado Crippled B-36 Fleet

Some of the structural damage indicated by a large portion of Striptype No. C-5000's (Crewer B-15 intracraniovascular bomb) that caught in a tornado which struck Gassett AFB, Tex., Sept. 1, is shown straddled in this picture just released. Wrecked portable maintenance stands crushed with the B-15.

Department of Defense explained that these photos had been classified as non-

publishable until the drawings had been examined.

More than 70 of the bag boundaries were loaded out. The pictures show some of the damage inflicted when uprooted stream-banks were loaded into the parked phones. Note top photo at right shows collection of toxic 1015 rods.

Am. Heart J. 1997;134:1041-1047

in top speed and by Oct. 5 had 71 of the planes back in service. In addition, Convair stepped up B-36 deliveries so that by that date Air Force had more of the big bombers available than it had prior to the storm. **Source code:** 575,410/246.

Lack of suitable disposal facilities was given as the reason for concentration of the sludge at one spot.



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WILLIAM

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LIGHTWEIGHT TITANIUM ALLOY replaces stainless steel in North American Sabre's airbody sections—the plane's "hot zone."

NAA Reveals Titanium Experience

Work to date indicates that stretching processes are better for this metal than impact methods.

Although titanium and its alloys are still undergoing a technically and special metal studies for aviation applications at high pressure, these materials already have seen considerable use in the airframe and engine fields.

One of the toughest production problems with titanium—forming of sheet for airframes—has been given close attention by North American Aviation Inc. All the attention hasn't been obtained, but currently available materials have been put to use where they will do the most good.

NAA's largest application of titanium is 500 lb. of the material in one model of the F-105—its approximate part of this fighter's total airframe weight.

Data on production and related problems were outlined recently by NAA's P. Robert Kotchick, before the annual meeting of the Society of Automotive Engineers, in Detroit.

► **Characteristics** Compared—NAA's use of titanium stems from the material's temperature resistance and favorable strength-weight ratio. Kotchick compares titanium alloy with high strength aluminum alloy (705-T6) and half-hard 30-3 stainless steel, using the relationship of ultimate tensile strength-weight vs. temperature (Fig. 1).

However, the graph shows that there is an area between 120 and 800° where aluminum loses its position, and where stainless steel, although strong enough, does not compete when compared on a strength-weight ratio. The dotted line for titanium alloy shows a favorable

ratio, but at the temperature indicated, completely loses the leading property. It is in this temperature range of 575-600° that NAA finds its requirements for titanium.

However, this comparison doesn't tell the entire story because, as Kotchick points out, there are other mechanical properties such as compressive yield strength and modulus of elasticity which frequently are limiting properties. Kotchick points out that there are

two sources for the high temperatures that are pushing titanium into the foreground. One of these is in the jet engine—where the jet engine, particularly where it is submerged in the fuelage. The other source—engine speed—is rapidly becoming significant.

► **Hot Section**—In the F-105 Sabre, with the engine located in the fuselage, the air body section is the "hot" zone. In the past, 10-15 stainless was used where the temperature was too high for aluminum. As more powerful engines were developed, Kotchick reports, more and more stainless was required, with weight becoming a serious problem. In the face of this situation, titanium's debut was opportune.

In addition to structural applications, there has been a need and often best results required to protect accessory equipment and mechanisms. Here strength is not as important as corrosion and heat-resistance. Commercially pure titanium does an excellent job in these applications, Kotchick says.

► **General Approach**—Early in NAA's concentration on titanium sheet, it became apparent that fabrication of the material into parts was not an easy job. Only recently did NAA get sufficient material quantities to begin real production fabrication.

Kotchick relates a few examples of what has been accomplished. He points out that these are not necessarily optimum practices—nearly the way NAA has been able to make the parts. He is convinced that better methods could be developed and expects that NAA will bring it about.

One of the big problems of going into large-scale production of titanium

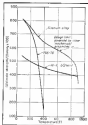


FIG. 1. Ultimate tensile strength/elasticity vs. metal temperature.

Valve Talk

for WM. R. WHITTAKER CO., Ltd.

By ARTHUR MILES

Senior Member, Aviation Section, ASEE



Ever hear of a hot air searchlight?

There is one—and it's still selling!

I refer to Whittaker's line of hot air valves that searchlight from a query into 160 different models and 20,000 units in two years.

Joe Globig, engineering vice-president, tells me it started early in 1950. Jet engines were pouring out air in enormous volume, with soaring pressures, temperatures and control problems. Control was the big issue—if available air was to be utilized.

Into the Whittaker plant came first a trickle of inquiries, then a steady stream. Finally almost a flood. And the "hot gasble" was launched.

It had been obvious for some time that hot air valves would be demanded for anti-icing, for cabin pressure and temperature control, for compressors, etc. The field was wide open. The problem was how to meet it.

Plenty of puzzles

Whittaker experts went to work. They analyzed, they studied, and they came up with plenty of puzzles.

What temperature range? What stresses? Would suitable materials be available? How much leakage would be allowed? How much air would be available in a year, two years from now? What power should be utilized to operate hot air valves?

Whittaker men found themselves drawn on a two-horn dilemma—not only must they design and produce hot air valves, they must also evolve a new actuator to operate them.

The complete package came the one year, from the beginning of January to the end of December, 1950, and in those twelve months the company handled nearly an experience, an growth and learning.

Producers of the first jet hot air units went on looking for engines coming out and so South American jet cockpit heaters, with deliveries in January and February 1951. Then came Douglas.

On flight tests, their performance fell below expectations. Why? Tests findings disclosed that Whittaker's hot air valves were inadequate to withstand enough the constant temperature and pressure values of jet engine air.

Digging out of a hole

The answer came in two fast phases. Design and manufacturing of efficient unit, and the modification of every single hot air valve that had been shipped.

The searchlight had shined a bit. But from that point on it picked up speed and went strongly. A half million dollars in Whittaker development costs

paid its first dividends in authentic industry response.

Today the 160 different "gasble" models range from one-inch to one-inch valves, weighing from a half pound to eight and a half pounds, handling jet air from a static 250 degrees to a hot 750 degrees, and pressures from five to 160 psi.

Yet the response is still one—hotter pressures, hotter temperatures, more and more cycles, even to the time the cycle life actually needed.

To meet these demands Whittaker has gone into carefully to develop jet engines, new processes and testing and other phases of material research.

Requirements exceeded

"The hot air valves we produce today are able to meet higher temperatures and pressure requirements than previously needed," Globig explained matter-of-factly. "More before we started now and then in the starting space we reserve for new work."

It's a healthy situation, though Requirements should always be put beyond our reach. They increase keeps the searchlight shining?



FIG. 1 Three punch press parts made by NAA of commercially pure titanium.



FIG. 2 Single blade actuator form alloy in 30 deg. Z section.

parts in the high cost of the material. NAA engineers decided to hold experimental work to a minimum and do the design test work on parts as they went along. This meant that tools and dies were made without a lot of the know-how that production men would like to have in detail rather than in guesswork.

Kostach reports that instead of delicate valves, "we frequently have had to say 'it will be pretty close to hand' studies."

► Cold-Forging—Some typical punch press parts in commercially pure titanium are shown in Fig. 2. The problem here was to maintain strength although fracture cost, the result, eliminated the failure.

A single blade actuator in form titanium alloy in a 30 deg. Z-section is illustrated in Fig. 3. The heat-treated was successful but the remote bend failed at about 35 deg. This distortion one of the worst problems NAA has faced. Since stock often bends well from one section, but fails when bent from the other.

Presumably one side of the sheet has absorbed more oxygen or nitrogen than the other during pickling and though there is probably some in the phenomenon that then, there is no explanation for it now. Picking the sheet with a nitric hydrofluoric dip has reduced the failure.

A section of a titanium alloy form forged cold by Hydroponics is shown in Fig. 4. This illustrates that titanium will stretch well, but does not stretch readily. The upper flange, with a greater radius after forming, has stretched less.



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48 to 64 durometer, elongation went down from 325 to 105%, tensile strength dropped only 26 points from 557 to 531 p.s.i., and there were no significant changes in any of their electric properties.

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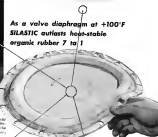


FIG. 4 Section of diaphragm after heat treatment by Silastop.



FIG. 5 Fingers Made were heated before forming operation on Silastop.



FIG. 6 Fast made on Silastop Hydrogen at high temperature.

initially to the prescribed contour. But the lower flange, with smaller radius than previously, has not shrunk so far. It has buckled. There are two courses open to make the buckling problem: the part can be formed with greater wall thickness or it can be heat-treated, Ketchick says.

►Heat-treating: A part made with the hot-forming procedure as shown in Fig. 5. This channel has both shock and stretch fingers similar to the cold-formed part, but could not be made cold on the Hydrogen.

The forming blocks were heated to 900°F. The cold blank was put on the block, then heated with a torch until it expanded enough for the tool body to pick up the tool points on the block. The hot blank and die were covered with loose asbestos fiber for insulation and a lead scribe (15-75 Silver) pad placed over the asbestos-covered parts. The part was then forced on the 10 dragons, with no buckling of the shock finger.

NAA has not examined all the limits of the forming methods or temperature. Ketchick expects that many parts have been made cold, more can be

made cold but are better if made hot (no buckling and springback), while some can only be made hot. Temperatures are being explored, but are not fixed yet. Then, the part shown in Fig. 6 has been made on a 500-ton Hydrogen at 600, 750, 900 and 900°F. All pieces exhibited the same amount of springback, Ketchick says.

►Knitting—One of the most successful forming methods is by stretching. Many of the NAA parts have very large radius of curvature, making it difficult to get hollow drawn without spring back. Stretching solves this, Ketchick reports, by doing plastic deformation over the entire length of the curve, and if the die is properly made springback can be positively eliminated.

The good contour that can be achieved is shown in Fig. 7, where the large flat blank is the curious composite.

A stretch press (50-ton Hydrogen) as shown in Fig. 8. Here, the part which was to be formed (shown buckled) at a 20-ton press made it straight within a minute. That part was given a stretching load of approximately 100,000 lb., and then swaged around the die. The fabric was creased by compression in the stretch, but parts have been made cold successfully.

Ketchick claims that the stretch press can be used most successfully when sufficient stretch can be given to the



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control to the alloy can be speedily adjusted without difficulty, resulting in less scrap in the process. Work of impact shocking, fusion welding approx. 1000 in. and probably will be limited to the most go ahead as well as, because of the very high thermal conductivity of the work a thinner oxide.

Speed After Heat-Treating—Consistent on the relationship of heat treatment to speed. Kotach observes that at Mach 2 at 50,000 ft, the calculated skin temperature approaches 3000° F. At Mach 3 for the same altitude, it is at the 6000° figure. The fact is about the double time for correct high strength titanium alloy. As planes go faster, the area of titanium will expand to the forward fuselage and wings.

Eventually, Kotach says, the parts that are now titanium will require even a better heat-treating regime and

those that are now aluminum will be more titanium.

Finer Look—On current design—especially in the commercial field—there are many places where titanium could be used if it could be produced economically. Lower cost per pound would make more utilization, Kotach claims.

There are two good factors, he says, one, when nothing else will fit the part, and two, when costs come down and weight can be used economically. New alloy and better production techniques can expand these factors.

It is probable, he thinks, that one or more of the new alloys will be cast directly suitable. In this new extruding process, are handle and then will in cross section use in aircraft.

Better rolling techniques will overcome one of the greatest handicaps—non-uniformity of sheet metal. —E



LONG LINE OF 140s is some from this Convair made to study production efficiency

Movies Help Convair Boost Output

Production speedup at Consolidated Vultee Aircraft Corp.'s San Diego division is getting a detailed, live look at manufacturing activities—in the movie camera. Convair is using the method to analyze production procedures that establish contacts, motions to boost efficiency. The company has shot and shows sequences of its fabrication and assembly lines, effects and exterior plant.

With the movie, it is possible to determine to production supervisors the overall details of a particular process without coming the details involved in it. During a group through the work

flows of work methods have developed where workers hold parts when they should be laid on fixtures. Crowding or underloading of work stations and misposition of transportation routes inside and outside the plant can be recorded, then improved.

Since, too, has been heated with use of the movie. Unsafe practices have shown up which previously had escaped untrained observers.

The films have proved especially useful in studying progress of plant layout projects. Convair says that they are more efficient than a drawing in which a



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Another alternative is the fuel-air combustion system. Essentially the same cycle takes place except

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Navy Contracts

The following contracts were announced recently by the Navy Air Materiel Supply Office, 280 Robbins Ave., Philadelphia 11:

Lucas Engineering Co., 220 Church St., Elizabeth, Conn., substitutes, \$94,000, \$24,112.

Beckett Co., Allied Chemical & Dry Corp., 200 E. 10th St., New York, summer coats, \$88,744 to \$12,724.

West Airlines Equipment Co., 421 Mulberry St., Trenton 3, adds to \$1,180,000. **Associated Mills Co.**, Newark, Mass., Corp., substitutes spring, springs, maintenance parts for F5U-1, 9 aircraft, \$12,102.

State Brothers Mfg. Co., 1411 W. Jackson, 17th, Chicago 1, adds to \$671,000, \$15,000.

Stearns-Rae Inc., 800 Broadway, 17th, New York, adds to \$1,180,000, \$1,180,000. **Chicago Power Plant Co.**, 100 E. 10th St., Chicago 1, adds to \$1,180,000, \$1,180,000.

Lucas Aircraft Corp., 1701 & 17th St., Newark 1, adds to \$1,180,000, \$1,180,000. **Lucas Aircraft Corp.**, 1701 & 17th St., Newark 1, adds to \$1,180,000, \$1,180,000.

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1. Boeing GAPA missile at instant of firing at Alamogordo . . .



2. Starts to gain momentum as it leaves launching rock with . . .

First Details of Boeing GAPA Project

Defense Dept. has released photos and details of Boeing's GAPA (ground-to-air) missile program—Missiles from 100 of these last vehicles were built and first test at Woomers, Utah, then at Alamogordo, N. M. Speeds of more than 3,500 mph. were reached by GAPA missiles in this series.

The program was begun at Boeing in 1945, under a USAAF contract, and firings were carried out from 1946 to 1949, when the project was completed.

The missile never went into production. Boeing also developed and built fixed and portable launching platforms for these defense weapons.

Examination of the photos on these two facing pages shows a clear view of the GAPA missile, indicating target properties. Additional power came from a solid-propellant rocket booster. The missile, less booster, is about 16 ft. long, 3 ft. in diameter.

Use of movable single-wing structure (and body on the missile) would make

it appear that the GAPA projectiles had to bank in order to track. Missiles such as the Tauchfeld Lark, with cruciform wings, are designed to maintain their control surfaces in horizontal and vertical position when turning, requiring less complexly defined reference lines for their guidance and steering systems.

In the firing illustrated on these pages, the presence of flames at the point of separation between the missile and booster bodies (photos 2 and 3) indicates that both aircraft and rocket were



3. Smoke and flame trailing behind, indicating that both . . .



4. Ramjet and rocket powerplant are operating, taking GAPA . . .



5. Up to stratosphere, with radar, etc., tracking its course.



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GAPA MISSILE is prepared for being at Abingdon. Small vehicles somewhat below size are probably for storage.



PORTABLE PLATFORM for launching is one of those designed by Boeing for GAPA.

set off simultaneously in this test.

Willem Allen, Boeing's president, pointed out in a recent report that the company is still busy in mobile work, although the GAPA project is over. Boeing's present guided missile is in the developmental stage, Allen said, but it is one of the largest projects in the company's engineering department and is expected to go on to completion. He was apparently referring to the XF-99 Bomarc, ground-to-air experimental vehicle.

The company has previously announced the customer of a Boeing guided missile test group at USAF Missile Test Center, Cocoa, Fla.

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IAS Papers Reflect Complexity

Specified complexity of the month industry was reflected in the program listings and papers presented at the twenty-first annual meeting of the Institute of the Aeronautical Sciences at New York last week.

Greatest emphasis was shared by aerodynamics and avionics, with three sessions in a day-long program for each subject.

The meeting was the general of two two days symposia to raise travel and loan ship freedom to other subjects. In a divided meeting of the IAS were de-

voted to fight propellers, aircraft design and structures. Other sessions on rocket propulsion, meteorology, aviation medicine, missiles, flight, safety and rotating-wing aircraft were held in co-operation with the professional groups representing these phases of aeronautical science.

Avionics. Werners presents on these pages the available summaries of the technical papers given during the first day session. Because of the length of this material, it will be run in parts, of which this is the first.

Flight Propulsion

► **Stall-Flutters in Canards.** Fernando Rios, Wright Aeronautical Div., Dayton-Wright Corp.

Assuming the principle of aerodynamic resonance to be small compared to blade inertia and elastic forces, some results from nonlinear analyses are obtained to develop a convenient method of studying stall flutter modulation in a new method of detecting the problem.

Data are presented from an exploratory experimental investigation on a "two-blade model" canards in which one blade and two thin blades are flexibly mounted. The response of dynamic nonlinearities with respect to stall flutter modulation is obtained for angles of attack near the static stall. Experimental observations are given for three different prebuckled states. The system is predominantly nonlinear.

Results contain critical observations from the nonlinear theory, nonlinear, transient behavior and equilibrium, forced oscillations, or "beat cycle." The effect of damping is contrasted with the assumed multi-blade mechanism. Other qualitative results concern the possibility of sloping the gap and approach in order to explain the gross features of stall flutter phenomena.

► **Stall and Surge in Axial-Flow Compressors for Jet Engines.** M. C. Hopton and W. A. Baines, Lewis Flight Propulsion Lab., NACA.

Blade failures attributable to resonant vibrations created by rotating stall have been reported in single- and multi-stage compressors.

A stage stacking analysis has shown that rotating stall will exist over a large portion of the compressor range at low speeds and will be mitigated almost instantaneously with compressor stage at high speeds.

In the stage stacking analysis to determine the range of compressor stage at which flow remains free of stall of adjacent stages was considered. In general, the presence of stall at the inlet of a compressor stage is much larger data indicated by an analytical formulation of compressor performance.

Compressor surge is attributed to a first mode resonance where the compressor stall point, and, in addition, as a few compressor fans and is a periodic surge, a small surge pressure discharge transient volume may result simply in stall of the compressor without the cyclic characteristics of compressor surge. In this regard, surge operation will be limited because of the large drop in performance accompanying compressor stall.

► **Aerodynamic Interference Between Main and Blade Rows.** Nelson H. Kemp, Goddard Space Flight Center, and W. A. Baines, Lewis Flight Propulsion Lab., NACA. This is a brief report on an investigation of mutually aerodynamic effects in a typical stage of an axial turbopropeller, caused by the relative action of the axial and main blade rows. The problem is attacked from the standpoint of the theory of thin airfoils in symmetry, aerodynamic, induced flow. The method of analysis is an approximate one based on the assumption that the main steady part of the circulation about any

blade is small compared to the steady part. Results include expressions for the non-steady components of lift and moment on static and rotor blades, expressed in terms to the steady values. The size of boundary of theory to the downstream wake position is also obtained.

Nonlinear results are presented for some typical configurations representing compressor stages. From these examples it appears that the maximum losses may be of appreciable magnitude (e.g., 11 per cent of the steady input), especially when the entry of the rotor blades is not "flooded" by the wake of the stator blades in the "root" zone. The magnitude of centrifugal effects depends strongly on the distance between the blade rows.

Structures

► **On Exact Solution for the Buckling Load of Flat Sandwich Panels with Loaded Edges Clamped.** S. V. Paoletti, Asst. Prof. of Aeronautical Engineering, Polytechnic Institute of Brooklyn.

This paper presents an exact solution for the buckling load of flat sandwich panels where loaded edges are clamped and unloaded edges simply supported. Method of solution is applicable for the case in which unloaded edges are clamped and loaded edges simply supported.

The solution is based on small deflection theory, and it is assumed that stresses are always below the proportional limit. The method for load and rate of constant temperature. Three equations of equilibrium, derived by means of the principle of virtual displacements, form the starting point of the theory. The equilibrium equations are partial linear differential equations with constant coefficients, two of the second order, and the third of the fourth order. The equations of equilibrium and stress boundary conditions are utilized to obtain the solution.

Nonlinear considerations have been made for the case of loaded edges simply supported. The method of solution is applicable for the buckling load in a function of plate aspect ratio and the rate of constant temperature. Each chart is valid for a particular value of a parameter representing the ratio of shear rigidity to bending rigidity. Values of this latter parameter are given in the range mentioned in most practical applications.

► **A Stress Analysis of Steel Straps.** Jacob W. Calkins, Harvey G. McCulloch, Lewis Aeronautical Lab., NACA.

A method is presented for determining the stresses in singly loaded steel straps having various cross-sections. The method is based on the use of a semi-empirical relationship that an approximately equivalent stress-free effect of the strap on the stress distribution that would exist with no strap. The analysis of singly loaded straps and double straps is carried out in a similar fashion.

► **The Corps Deflection of Beams and Columns.** H. H. Hsu, Asst. Prof., Dept. of Engineering Mechanics, and Joseph Mann, Prof. of Engineering Mechanics and Research Lab. of Engineering Mechanics, The Pennsylvania State College.

This paper reports on the development of a theory for determining the creep de-



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THE DANGER OF FIRE from a regular hydraulic fluid is clearly seen here. The fluid was sprayed onto a piece of 3000 psi through an acetylene flame of 4300°F. A 10-foot flame sheet out.



NO FIRE OCCURS when H₂ non-inflammable hydraulic fluid under goes the same test. The CAA Technical Development and Evaluation Center, Indianapolis, made the test and gave the fluid a flammability resistance number of zero!

In this purpose is discussed. A study of complete systems of systems for selling pull-out calculations is discussed.

Literature on systems distributions of horizontal tail loads shows that a reduction in loading was the finding should be assumed. Asymmetrical loadings are barely mentioned.

Literature on buffering shows its presence and significance. Recent studies of internal methods of testing the problem are discussed heavily relative to needed data and possible applications.

Modulations and instantaneous steady state which are barely discussed.

►Notes on the Analysis and Design of Multiple Stiffened Wings, D. M. Taylor, Camp Lehigh, Structures Research and Development Group, Langley Airfield.

This paper discusses an unconventional type of wing construction which allows greater use of vertical loads to stabilize the compression side against buckling by tying it to the inherently stable tension skin. This construction offers two manufacturing advantages: (1) additional loading applied through the spar between the ribs and (2) lower internal stresses necessary to attach parts in comparison to sheet metal.

Struts installed along the lines of parts are needed to achieve high buckling strength and to prevent an undesirable type of buckling involving both tension and compression skins. However, these struts would be only accessories in a self-strengthening skin.

Theory recently developed by the NACA is summarized, and the results of large-scale static tests conducted at Northrup Aircraft, Inc., to substantiate the design of a complete pressurized wing are discussed.

RPI to Study Airflow By Electric Analogy

An electric tank filled with current-conducting fluid will give the same results as flow around an object by using the electrical potential in the solution at Princeton Polytechnic Institute, Trenton, N. J.

Major study problem for the new tank will be low conditions around fluttering airfoils.

The project is under the sponsorship of the USAF Research and Development Command, Office of Scientific Research.

Original research in France developed the electrical analogy technique. The French studies showed that electrical potentials measured in conducting fluids are mathematically equivalent to pressures in actual airflow. A technique for two-dimensional analysis has been perfected by the French, practicable at ONERA, the equivalent of our NACA.

The RPI tank will be constructed to study three-dimensional flows as well as the two-dimensional problems. Dr. Paul Lifson, of the RPI staff, is the principal investigator on the project.

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adjustment for the two-to-one stock split effected early last year. Close behind is Boeing with a gain of 66%, adjusted for a one-to-two stock split last year. In third place is General Dynamics (included because of the major contribution made by Convair) with a price increase of 63.6%.

From that point, there is a wide gap until Republic's 43.5% increase is reached. Again, there is a wide spread below the 25% gain reported by Sperry is noted. The rest of the list tapers down from that point.

It is noteworthy that most of the finished 1952 pretty much at the top of their range of last year. Convair is a notable exception. A study of the table also indicates that during 1952 almost all of the equities shown did not all reach below the closing quotations recorded at the 1951 period.

Investment Prospectors compiled here recently (Jan. 5, p. 18), considerable stability of operations for the aircraft industry has led to sustained earnings and hence the continuance of cost cutting and liberal dividend distributions.

There is no doubt that the earnings and dividends have imposed the investment standing of aircraft equities. No longer are they regarded as poor risks because of the post-war situation and the sharp fluctuations of military appropriations. More investment firms have begun to reduce the weighting both of high volume production now inherent in the aircraft industry. All this has simply been reflected in the market price of aircraft equities.

The wide disparity in post market fluctuations of the individual companies is a vivid reminder that not all units in the industry will participate evenly in the business and earnings to be developed in the future. Technological progress in the associated arts, shifts in the military procurement policies of the services, and the engineering and managerial abilities of the companies themselves remain as the major elements influencing the trend of leadership within the industry.

As future patterns evolve, the market place will continue to serve as a sensitive barometer of the relative progress or lack of it, among the various aircraft companies.

—Sally Althoff

McDonnell 6-Mo. Report

McDonnell Aircraft Corp reports a record backlog—\$468,655,368—as of Dec. 31, end of first half of its fiscal year.

The company earned \$1,816,610 on sales of \$55,152,531 for the six-month period, compared with \$1,607,775 on \$54,525,570 for similar period last year.

The year's figures are after deducting \$516,770 amortization for emergency facilities.

20th Annual "Inventory of Air Power" COMING MARCH 2nd

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MILITARY AVIATION

On-the-spot reports from Korea by Aviation Week's correspondent will provide a picture of Military Aviation in action. This section includes design requirements data, information on the current program and production progress.

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The great progress that has been made in this rapidly developing Aviation Field by the Industry and Air Force will be reported in detail. Approved information will also be incorporated in special first hand reports by Aviation Week Editors.

PRODUCTION FOR AIR POWER

World requirements and commitments to plan the growing program of the U. S. Air Force indicate the huge production task now being fulfilled by our Manufacturing Industry. The Inventory Number will analyze our production picture.

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With Avionics—making the brain, the eye and ears of today's Military Air Force, the constantly developing 100 percent Aeronautical Market will come in for special attention in the "Inventory of Air Power" issue.

NORTH ATLANTIC AIR POWER

The NATO buildup in terms of Air Force requires additional and heavy loads upon our productive capacity. McGraw-Hill correspondents in the key cities of these nations will report and interpret each nation's requirements.

RESEARCH

What is the Research budget? What are the chief areas of Research? What is the trend of expenditures? What new facilities are needed? The 1953 "Inventory of Air Power" issue will examine Aeronautical Research and report on these questions.

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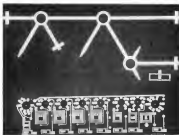
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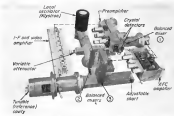


1 The weight and space-saving capabilities of the recently announced Microstrip technique of fabricating radio wave guides and components are illustrated here. (Left) Telecommunications Laboratories (an AT&T affiliate) has constructed an experimental Microstrip version (shown left) of the RT and IF portion of the 5000-cm receiver (shown right). By replacing conventional components with Microstrip parts, TEL brought weight down to 4 lb. from 70 lb. The receiver was constructed separately from ground plane by Delco-Remy (shown, left).

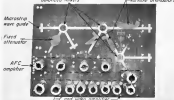
Microstrip Brings the Size Down



2 Experimental layout shows how Microstrip can be combined with ground circuit techniques that form IF transformers and microstrip resonators, etc.



3 Comparison of conventional receiver (shown) and Microstrip version (below) shows structural similarity. Weight and space economy appeal to industry.



4 Compact layout possible with Microstrip offers 40 higher beam and, in the process, eliminates need for parasitics between crystal mixer and IF amplifier.



5 Other receiver components are mounted underneath to copper ground plane. TEL says Microstrip components cut only one-half the cost of conventional devices.

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► **F-4H Gets New E-9 Autopilot**—Republic Aviation's surprising F-4H will use the new Westinghouse E-9 auto pilot, a stepped-down, lighter-weight version of the W-34, autopilot used on the Lockheed F-4C (Aerospace Week Oct. 15, p. 40). Because of the F-4H's ground-support mission, the E-9, unlike the W-34, won't incorporate an R-8 approach computer as designed to fit it with a radio for control system E-8 designation. A USAF associate said and reflects the fact that E-9 is produced by

USAF, whereas the W-34 is sold to Lockheed directly.

► **Westinghouse Buys Computers**—Westinghouse Electric Corp. has purchased several Boeing Aircraft analog computers for system stability studies of new aircraft voltage regulator designs at its Lima, Ohio, plant. Computers will also be used to study regulator performance in multi-generator power systems as well as for mechanical problems such as designing vibration dampers and springs.

► **Douglas Seeks Best Reliability**—Douglas Aircraft Co. is investigating a mounting rail, which has cooling air ducts on

need to such piece of equipment. A. W. Rohrer, Douglas engineer, says the company hopes to raise cooling efficiency from present 5% to at least 10%. An aircraft-mounted heat exchanger DC-7 equipment rated at 5,500 watts, double that of early DC-6's. The heat exchanger must also find that there will have to dissipate 7,000 watts when they go into operation in new future.

► **Anac Inset Spec on Crystal-Accr Control**—Rohrer, Inc. (Detroit), has released Specification No. 485, its first spec covering control units used as an air radio equipment. New spec generally follows military specs on crystals but calls for higher frequency variation tolerance (±1.000%) when operated in a wide band range of ambient temperatures (−200 to 70°C). Anac spec follows MIL, spec on cooling for ±1.000% variation for wider temperature range of −40°C to 50°C.

► **Aerovox Buys Anac-Aerovox Corp.**, large manufacturer of capacitors and precision resistors, has purchased Anac Electronics, Inc., of Pasadena, Calif. Anac, which makes radio filters, band pass filters, power supplies, inductors and electronic magnetic assemblies, will be reported as a subsidiary.

► **Sperry Ties Magnaflux-Sperry Corp.** has rebranded magnetic amplifiers for vacuum tubes in one step of its A-12 autopilot as an experimental item. Company says that magnification is "being incorporated in several different aircraft control systems."



RE-66 AUTOPILOT CYBE

Newly developed gyro, which can be remotely read and managed, will provide the vertical reference for Minnephore-Rohrer's new E-11 electronic pilot, stand for use on the Douglas B-56B jet bomber (Aviation Week Jan. 9, 1967, p. 28).

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AVIATION SAFETY

ALPA Enunciates Safety Policy

Sayen details pilots' views and the organizations they have set up to deal with safety problems.

The most comprehensive policy statement on aviation safety that has been associated by the general administration of the Air Line Pilot's Assn. has been released by the president, Clarence N. Sayen.

Sayen stated the statement originally in an all the record address at the annual meeting of the Flight Safety Foundation in Honolulu.

Sayen disclosed that ALPA members ship is now about 4,000 active pilots and approximately 2,000 inactive pilots and co-pilots employed or formerly employed in 61 domestic and international U.S. air carriers.

The following statement discloses the main argument for the structure for providing of safety problems.

Why ALPA Needs A Safety Organization

The airline pilot is the primary concern or factor at the projects, projects procedures, or innovations that are designed to improve air safety in commercial air transportation. The co-pilots are people who are concerned with safety and maintain an independent organization dedicated to the improvement of air safety. These are several other basic reasons:

- The airline pilot has a primary responsibility for safety to his passengers, and the general public which cannot be delegated to anyone else. Whether his customer, the federal aviation agency, or any other person or agency. The airline pilot cannot, in good conscience, and in face of this responsibility, accept a project, project, procedure, or innovation of which he has any doubt as to its safety.

- The airline pilot has a natural interest in the development and growth of an organization. Air transportation is his business. His own safety depends on its prosperity. Since, his initial employment, an airline pilot is old at 22, his professional career is terminated with his initial employer when he reaches 35.

Unlike even the president of the company, he cannot readily transfer his knowledge and skill to another company thereafter. His "experience" is a personal airline pilot to be used at trade. He is not likely to look highly at projects, innovations, or aviation pro-



Clarence N. Sayen

cedures that might feel like a central interest. His reason is his primary responsibility to the public and to his professional career called "experience" on the job.

- The professional airline pilot is interested in his own self preservation and economic gain. One of the greatest safety, most of commercial air transportation is the fact that most airline pilots are conservative people.

ALPA's Safety Functions And Projects

1. Continuous Monitoring of all Commercial Aviation Facilities

Every airline pilot utilizes practically every commercial aviation facility in the world (outside of Russia) every day. In addition, practically every type of commercial aircraft, aircraft component, radio, communication airport, etc., is utilized daily by a professional pilot. Therefore, it is available, therefore, through this means a continuous monitoring of all aviation facilities. If the records of routine pilot reporting and special incident reports, the aviation industry has available its greatest source of information to determine that safety problems exist.

A corrective one of the primary safety functions of the airline pilot is to be the discovery and reporting of air safety problems. Anything that interrupts or

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used Solenoid Contactors are designed and produced (exclusively by Guardian) to be completely assembled, adjusted and tested before the sealing operation. The envelope is not a part of the structure, thereby enabling these Guardian Solenoid Contactors to surpass all tests specified. Maintenance tests meet MIL, AN and JAN requirements for all jet aircraft. Test charts available upon request.

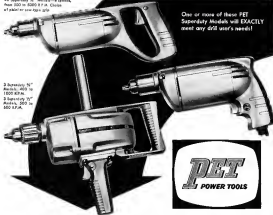
increasing numbers of aircraft designers specifying extremely high temperatures for controls are able to gain all of these distinct advantages: (1) Guardian's New Sealed Solenoid Contactors meet or exceed MIL-R-6106, MIL-R-5757, JAN, AN, specifications and will meet or exceed all corresponding MIL-R specifications. (2) Tests pass tests up to 120° C. (3) They equal or exceed tests for 50-G shock. (4) They are furnished wood from the top to eliminate difficulties of accessibility during assembly, making it possible to remove

test nuts and bolts that frequently dropped into otherwise accessible areas. These 100-150-200 and 225 ampere (24 V.D.C.) units permit torque testing at all connections. Wringing set torque switches lightly in cases of open switches will not change the solenoid or coil. Special units are available with a new Guardian developed insulation that resists cracks, damage or abuse during installation. Insulation does not change test requirements. Units, normally grounded, can be furnished insulated from ground at slightly extra cost.

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Any maintenance or production crew will agree that the right drill for the right job means three things: better work, greater efficiency and longer drill life. So why compromise on a drill that's "almost" right?

PET Superduty Drills are available in 34 separate and distinct models... the various speeds and rated power have been carefully selected on the basis of what industrial users have needed and asked for. Result? You get a wide selection... and end up getting the drill that's exactly right for your work.

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- Reserve Power for the extra-long job
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- Power Ventilation for cool running
- Aluminum Alloy Die Castings for light weight, easy handling
- Compound Shafts makes hard-to-drill drilling life easier and longer
- Meet U.S. Government and Military Specifications

informs them of the free flow of this information in itself constitutes a hazard.

The ALPA then must perform several important functions to most efficiently render this service:

• Studies must be provided for continued research in the investigation and reporting of hazards or accidents. The role of the critic must be maintained and must be attractive.

• Channels must be kept open and an independent organization provided through which reports may be properly forwarded and effectively made known.

• A medium must be provided for following up on reports to see that action is taken. The organization, individual who serves was made from his work becomes frustrated and the work stops. He may cease to bother people with his complaints and the level of safety will drop accordingly. Consistency has never sponsored progress.

2. Incident Reporting

It is not easy to keep the channels open for incident reporting. Both officials of government agencies and airline officials have taken action at times which almost completely shut off incident reporting on some airlines, and drastically reduced it throughout the industry. They, therefore, created a hazard of greater magnitude than that which they were at the moment trying to eliminate. . . . (A detailed report of President Nixon's views on incident reporting was printed in Aviation Week Jan 12, p. 15.)

3. Special Projects

Whenever we conceive the primary responsibility of the pilot to be the discovery and reporting of an safety problem, ALPA reviews the necessity for the pilot in operational viewpoint being applied in the solution of problems.

Therefore, in addition to the organizational personnel at problems of the local, national, and international level which will be discussed later, ALPA attacks specific problems on a special report form. This is accomplished by designating individual pilots with specialized training or experience along a particular line in specifications and specifications for the Association as a specific subject. Consultants are set up to work with the operators. The committee and personnel have available to them the channels and facilities of ALPA from which to gather information or determine pilot opinion.

In this manner, pilot specialists, often with industry connections, try to find solutions to air safety problems as a position in respect to safety. They are also in a position to determine the "common acceptance" of the air safety.

ALPA currently has 18 special projects.

costs in progress including such subjects as airport lighting, fire prevention, cockpit instrumentation and others too detailed to discuss here.

4. Contact Writing for Safety.

Safety considerations must permeate an other aspect of ALPA's activity—first of all, the writing of correspondence, rules and working conditions for pilots. Since ALPA is by law the collective bargaining agent for practically all of the airline pilots in the United States, ALPA, with the co-operation, largely dictated, the rules and working conditions of pilots. Between cost and certain must be concerned that safety is a primary consideration in this service.

By this action, among others, active line pilots participate and make the last decisions in all ALPA's collective bargaining sessions.

5. Accident Investigation for Safety.

ALPA participates in the investigation of all major air carrier accidents. Standard investigation and reporting procedures have been worked out and are forwarded to pilot representatives for the purpose of each investigation made to the president of the Association. Such reports are analyzed by ALPA staff members and pilot representatives for their own, prevent future accidents.

Recently the practice of reporting the probable cause of the accident has been questioned. In this regard, it should be noted that ALPA readily admits that there are "pilot error" accidents.

However, it holds that no pilot ever erred deliberately or in the intent of self-destruction. ALPA is interested in the reason behind the error and holds that any accident written off as "pilot error" has not been adequately investigated.

For example, did the error originate in design flaws, fatigue limits, cockpit layout, maps, inadequate training, etc.? ALPA feels that this view point must be strongly represented at all accident investigations if the operational aspect is to be thoroughly explained and the association benefit from each accident.

ALPA'S Safety Structure

1. Primary Up-to-the Local Council

The basic unit of the ALPA safety structure is the local council. At each domestic where a minimum number of the pilots of a particular airline are based, a local council is organized. Each council has a Local Council Air Safety Committee which is charged with the processing of local air safety problems. This unit includes contacts with the local airline, government, etc., as well as other officials. Surveys conducted by ALPA are processed through the Committee.

There are currently 115 Air Safety

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Committees throughout the United States, Alaska, Hawaii, Puerto Rico, Great Britain, Germany, Egypt, Peru, Brazil and Japan.

2. **Airline Control Air Safety Committees.**

The pilots of our airline may have 10, 12 or 14 regional Representatives from each country comprise the Airline Control Air Safety Committee. Problems common to more than one Council or concerning the entire airline are processed through this Committee. There are currently 11 Airline Control Air Safety Committees.

3. **Regional Air Safety Committees.** Representatives from the Council

Air Safety Committees in a particular region comprise the Regional Air Safety Committee. For example, representatives from 15 Air Safety Committees make up the New York Area Regional Air Safety Committee.

This Committee processes problems which are peculiar to a particular geographic area. Example: the noise problem in the New York area.

4. **National Air Safety Organization.** The National Organization of ALPA members in Engineering and Air Safety Department through which problems from the 115 Council Air Safety Committees, 41 airlines, or regional committees may be processed. The air-

line organization currently serves as the spokesman on national problems as designated a pilot spokesman or pilot committee to speak for ALPA on those matters.

A "draft release" procedure is employed to select a representative opinion on a subject. Special committees are assigned to analyze their findings for comment to all Council Committees. The industry representative who finds that he has present pilot opinion by the process of speaking to several pilots at random is more... However, we will occasionally hear the statement, but I spoke with several pilots and they told me this is what the pilots want!

If you want representative pilot opinion, go through channels to the pilot representatives.

The 12th Convention of ALPA was held for an Annual Air Safety Forum. This will be an annual convention of safety representatives from each airline who will discuss their meetings entirely to air safety problems.

International Federation of Air Line Pilots Associations is a federation of pilot organizations from 20 different countries, with sister offices in London.

The processing of safety problems at ICAP is effected for the member organizations through IFALPA. An annual meeting is held of representatives of the 21 member organizations.

Special study groups are established to deal with individual problems. Study groups are constituted in each geographical area of the world to analyze accidents and represent pilot viewpoints on problems peculiar to the area and concerning which pilots bring continuously, at the area will be best informed.

Safety vs. Economics

ALPA represents pilots in their economic problems as well as their safety problems.

We are familiar with the constant oversight of the safety specialist that the airline agencies and government agencies too often get their emphasis on safety thinking sound and that safety enters in a result. It is never to suggest, therefore, whether ALPA expresses any safety authority on any circumstances dictated by economic considerations.

This question may be answered in two ways.

• ALPA is a strong enough organization to present its economic problems without recourse to the violation of safety as an argument. Safety decisions may be made without the consideration of utilizing such decisions toward achieving an economic goal.

• But we must be realistic enough to

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Here's a project, in Marietta, Georgia, where Lockheed's Georgia Division has a long-range production schedule for F-47 Jet Fighters and a more recent contract for the C-130A Turbo-prop Air Force Cargo Plane. Incidentally, the C-130A is a Lockheed design so you see this is a forward looking concern which provides opportunities for creative talents as well as production "know-how."

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GREER DYNAMIC HYDRAULIC TESTER checks all hydraulic accessories except pumps. Operates with variable volume and pressure dynamic tests to 5,000 psi, static tests to 15,000 psi, flow rates to 10 gpm. Above, check valves for tandem boost of Cutlans are being tested.

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Again and again, leaders in the aviation field turn to Greer for maintenance and test equipment. Proven in this field, Greer has standardized its machines until you can order them for most purposes right out of a catalog (write for your free copy on company literature).

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men required that sustained economic problems indicate safety and sound, therefore, be considered "over-sold" problems indicate safety. The airline industry is susceptible to "wax of wax." Low morale adversely affects safety.

We are cognizant of (1) the requirement of carrying excess capacity in flight operations during periods of economic crisis or low morale, and (2) the desirability of making, as expeditiously as possible, solutions to problems which arise.

If there must be a change, over an issue, it is better to have it quickly and reach a decision.

The Bilateral Approach

Even a designer of dashboards would not put his responsibility as the result of a unilateral approach to the "consumer's acceptance" . . . and then when the consumer takes the perspective of acceptance or rejection. Yet, an engineer in the airline industry, we still have new pilots, standards and procedures placed into operation without pilot representatives ever having been consulted or informed.

In a recent instance, the given weight of an aircraft was altered without consultation with or information to the pilot associations. This despite the fact that given weight increases after the performance, safety of the aircraft.

It is my belief that the next step must be represented throughout the conception, design, testing and adaptation of aircraft. Their design, construction, or significant portions of the maintenance of safety and acceptances to be achieved. The existence of an efficient and acceptable maintenance of pilots have facilities for the dissemination of information and an experienced structure capable of making available responsible personnel through whom government agencies and industry representatives may work in of positive value in accomplishing this goal. Through new agency, government and industry may sample the "new viewpoint." Economic viewpoints and decisions which are reliable may be reached.

One further point should be made clear on the ALPA viewpoint and representation for safety.

We do not believe that a bilateral approach by the government and pilots, or management and pilots, to safety problems deprives the government official of his authority or the management official of his managerial prerogative. It is simply a more effective way of assuring air safety—a responsibility the pilot cannot avoid or delegate nor the government or industry avoid or delegate.

Press manufacturer saves money on tools and gets better finished machining with pre-hardened, free-cutting Carilloy FC Steel

Vernox Allsteel Press Co., of Chicago, now makes the dies for big press breaks from U88 Carilloy FC steel instead of an ordinary die steel. Pre-hardened, free-cutting FC steel enables this important manufacturer to make harder, smoother dies that are easier to produce.

Here's what Vernox says about the performance of FC steel: "This steel

cuts much cleaner and more easily than the steel we have using. As a result, our cutting tools last much longer and the dies are not damaged during machining—even though we are using a much harder steel (500 BHN instead of 250 BHN). In addition, we put a smoother finish on the die.

"Smooth finish is especially important in press breaks dies, because

metal is literally drawn over the die during forming. With clean, smoother dies, less pressure is needed to make a bend and the dies do not wear the metal.

"Since the dies are harder, they work better on high tensile steels . . . often eliminate the need for re-treating the dies after use. We're well satisfied with FC steel."



Press breaks dies being placed from free-cutting Carilloy FC steel at Vernox Allsteel Press Company. Carilloy FC is much easier to machine than the steel previously used, so tools last much longer. In addition, it enables Vernox to get a smoother finish and to use a harder steel for the dies. As a result, the dies give better service.

Carilloy FC is ready for use when delivered.

U88 Carilloy FC steel comes to you already quenched and tempered to the hardness you require and doesn't require heat treatment after machining. It comes in all standard bar sizes and sizes in a hard non range from 250 to 375 Brinell. Tensile strengths ranging from 135,000 to 175,000 psi are available.

Our experienced metallurgists will be glad to discuss the specific applications of pre-hardened, free-cutting FC steel to your products. Ask us to visit United States Steel, 120 William Penn Place, Pittsburgh 30, Pa.

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► **Mobile Base:** Walcott told *American* Where the Nationalist Guard claims not to be is the only one in operation.

Also aboard is a dining room for VIPs and entertainment purposes, and a dispensary, where an X-ray machine is used for treatment of personnel injuries and occasionally for checking the aircraft fuselage and engine.

• **Hydraulic**—A Cater hydraulic tester, Model FP85-1, is used to check engines and fuel booster pumps. Other Cater machines are used to test the

• **Sparkplug**, CAT

currently is planning to purchase a new machine. Fluid bearings will be used and micro-

can track, survey, and analyze the weather. The unit is expensive and is a necessity of 25% of the fleet.

• **Inspection:** CAT has excellent results from methods on water.

is simple and useful to have an on-site readings inspection say they with Zyle Inspection and other com-

Accession Sheet

- **Synology**, CAT currently in phase

• **Instrument.** The air-conditioned instrument shop has hardwood work benches that do not shrink or warp and are exceedingly strong. All instrument spurs are stockied in the shop to take advantage of controlled humidity of air conditioning.

• **Inspection:** CAT inspection say they get excellent results with Zyxte inspection methods on wheels and other non-

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ferrous metal parts. Extra large rods
and trays have been provided in the
LS7 to accommodate such bulky parts
as landing gear struts. Manganese is
used to increase parts' compressive
strength to ensure that they are
not deformed by the De-Check
method, which CAT uses to ease to
size and shape.

• **Calibration.** A leveling device keeps
the calibration beamwise levels in
constant position during patch and roll
of the CAT.

• **Propeller.** The center uses three
methods of balancing propeller blades:
leads edge, double overlapping roller,
and horizontal or suspension. The LS7
must be balanced before vertical bal-
ance can be used.

• **Wood work.** Chrome copper roller
shipping boxes to fit each instrument
and line the boxes with a two-inch thick
foam rubber to protect against jarring.
• **Photographic.** Photo instruments put
22 measurements records on a single
film to provide permanent records in a mini-
mum amount of space. The flap is
self-stored with detection equipment.
• **Parachute.** CAT is one of the few
instruments to provide its covers with para-
chutes. They are used on military and
cargo flights. The flap contains a para-
chute (36x24 ft), packing table covered
with doped aircraft fabric. An esti-
mated 250 lbs. are kept in a de-
bonded locker in the air conditioned
flap. The 16 ft. diving tower is hoisted
to speed diving process.

Airborne Radar

Cat Air Transport plans use as a
major of aviation, 1000-type airborne
color radar, in the airline's fleet,
while most major airlines still use
superimposed with the device.

The equipment, labeled APN-2, is a
magnetic and CAT integrates an in-
tegrated ground transmitter. CAT
pilot only on ADF for directional guid-
ance. Between APN-2 and ADF, CAT
pilot can give a warning log of dis-
tance, bearing, and altitude.

• **APN-2 Operation.** In operation,
a vertical light line appears on the APN-2
scope and stretches its full diameter.
This trace is interrupted by a beep that
shows up in a shadow and moves from
top to bottom of the scope as its in-
tercept approaches destination. The act
may be adjusted for ranges up to 30,
50 and 100 miles. Dual Yags may re-
ceiving antenna are mounted on the
side of the plane's nose.

First Yags range give the airline's
pilot additional navigational aid.
CAT pilots are enthusiastic about
APN-2. They say it has allowed them



SKILLITON (disposition) of large CAT
mill bonded to keep from Japan

to maintain scheduled flights in and out
of Fukuoka in weather that grounded
other carriers.

Officials indicate the unit also has
used money for CAT, although no
figures are available.

The APN-2 sets transmit on a fre-
quency of 125 mc and receive on 215
mc. CAT has received no complaints
about interference.

The sets are not difficult to maintain
and have a reliability comparable to
ADF equipment, according to W. F.
Henderson, CAT assistant chief of con-
struction.

CAT paid \$400 for each set, pur-
chased in one single equipment. In
addition, cost was approximately \$100
and required about 10 man-hours per
assembly, the airline says. Short initial
work cost an additional \$50 and re-
quired 10 man-hours.

• **Radar Upgrade.** APN-2 and radio
equipment is pulled out of the aircraft
every 125 hours for overhaul and tests.

Aircraft such as kept in daylight
dorms and closed closets because of
Japan's humid climate and particu-
larly air. CAT has a waterproof
housing to store their equipment at
airbases such as APN-2 receivers and
transmitters. The room is tightly sealed,
and dehumidifiers control humidity
levels, keeping the temperature at a con-
stant 95 deg.

Flight Operations

CAT air operational problems are re-
duced by high humidity and air re-
sponses on the carrier's route. Other
hazards are little that goes unnoted
in the air traffic. Landing gear and en-
gines take a beating from the exposed
runways.

The airline flies over long stretches
of open sea and around mountain peaks

STARTLING FACTS ABOUT GILFILLAN GCA RADAR

A Gilfillan GCA Radar now costs less than \$375,000.
But one Gilfillan GCA Radar on two Jims alone,
saved 300 A-1H aircraft, valued, even at that time,
at \$900,000 each—a total of \$60,000,000.

One Gilfillan GCA Radar in the Azores, during a
period of 6 hours, saved three C-47s, seven G-2s,
and two B-25 aircraft.

On the Berlin Airlift one Gilfillan GCA Radar
landed 14,000 aircraft during a ten-month period.

Eight civilian GCA Radars in the United States
are officially credited by the CAA with saves of
77 aircraft under extreme emergency conditions.

The 14 U.S. and foreign airlines operating through
Gander, Newfoundland have, by mutual decision,
selected Gilfillan GCA Radar as the exclusive
navigational aid. This Gilfillan GCA Radar has a
perfect record of 14,000 safe landings.

Gilfillan GCA Radar equipment is used in landing
5,000 planes every day around the world.

Even those few examples, taken from a phenom-
enal record of more than 3 million Gilfillan GCA
landings, make one fact irrefutable: the value



of safely landed aircraft alone completely over-
shadows the original Gilfillan GCA Radar cost.

To this must be added the incalculable value of
human lives, of international goodwill, of increased
public acceptance of air travel.

Gilfillan GCA Radar is the official landing aid of
the U.S. Air Force, the U.S. Navy, the U.S. Marine
Corps and the air forces of Australia, Belgium,
Canada, Denmark, Great Britain, Italy, Nether-
lands, Norway, Portugal and South Africa.

Only Gilfillan GCA Radar is standard equipment
among 24 nations of the free world.

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Design and Production—the FIRST name is...



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Your commercial requirements for lightweight castings in aluminum or magnesium may be tough, but we'll welcome an opportunity to look them over. We've tackled a good many diversified casting problems over almost a half century.

Our four completely equipped plants and their trained personnel are at your disposal.



*Well-Cast

MILITARY LIGHTWEIGHT CASTINGS

Armored wheels, strut parts, engine parts and miscellaneous components are being made every day at our plants, in aluminum and magnesium. A Ray inspection, close attention to detail, complete facilities for production in sand, semi-permanent and permanent mold form.

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Well-Cast Ampco Bronze Castings.

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CAT WELDERS set up shop on LST carry away on deck at Kinkaid base.

at from 9,000 to 12,000 ft. high that run the length of Formosa. Yet it has a near-perfect safety record.

► **Talisker Weights-CAT** uses three different sets of talisker weights for its C-46 transports.

► **Flight operations** into civilian fields and planes chartered by the U.S. Air Force may be loaded to 45,000 lb.

► **Paratrooper flights** in and out of civilian fields and those carrying commercial cargo may be maximum of 45,000 lb.

► **Commercial flights** operating into military fields are restricted to 45,000 lb. because of regulations applied by U.S. Civil Aeronautics Administration on civilian operations at some of these airports.

CAT operations say the airline has operated for five and a half years without a single accident in C-46 service carrying the 45,000-lb. weight maximum approved by National Civilian CAA.

► **Talisker Rate-Route** installations for CAT's C-46s are being developed by the Yaw Yaw, Canada's technical assistant. The plan, still in design stage, calls for an Airfield Corp. bases—there on each side of the carrier wing panel.

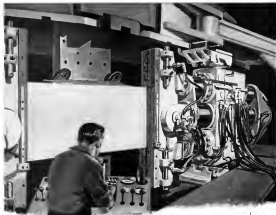
The airline hopes to use rockets in an emergency auxiliary power as one of engine failure during flight.

The U.S. CAA has not approved CAT's Rate-Route development yet, but says he hopes test installations will bring about a certificate for the Rate development.

Another change scheduled for all CAT aircraft except the PBT is installation of Scintilla ignition switches. Grundy says his choice was motivated by the immediate availability of Scintilla units, their cost advantage and portability. The chief engineer says CAT will use Scintilla as interim arrangements on long hops where flight engineers are added to the plane crews.

The airline already has fixed seat legs on its C-46s in a 94-to-18-degree position—on the Philippine Air Lines—in an effort to reduce maintenance, weight and cost. CAT is working not a plan with Bell Airways for exchange of C-46 maintenance information.

► **Polyjet Like-All** CAT coplanes are



to work forming of ductile material. High strength aluminum alloy chosen as subject metal.

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Frequently, where indicator lights must be used in unusual switch positions, modern aircraft design affects a worthwhile weight and panel space saving by using Hetherington switches with built-in lights. Developed originally by Hetherington as horn call lights, these compact little units are now available for a broad range of aircraft commercial or military aircraft services. Write for catalog.



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switch with built-in
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Push button switch
with built-in light and
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switch

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HETHERINGTON, INC., Sharon Hill, Pa.

(First Class Station, 2124 W. Washington Blvd., Silver City, Calif.)

AVIATION WEEK, a record on rugged sailing for the CAT's sport crew.

American, except for one British pilot. Captains are American or Chinese, and most radio operators are Chinese.

At least 11 other nationalities are employed by the others: Filipinos, Russians, Japanese, Koreans, New Zealanders, Austrians, Viet Namites, Portuguese, Costa Ricans, Belgians, Italians and French.

Despite the nature of automobiles, CAT officials say they have no major labor troubles, and the whole project goes well together harmoniously.

Supplies—supplies problems plague CAT personnel officers. Engines sent to the United States for overhaul take at least six months to return. Shipping costs alone are \$600 per engine.

The schedule is forced to steel joints six months in advance, making it necessary to fill the empty gaps with weapons, parts and components mounted to keep in action in operation. That is a strain on the crew's capital budget.

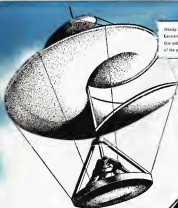
Shipping parts into Fuzhou involves expert and expert buyers and application for duty orders.

Charles Carver, American general manager of CAT, describes CAT as "the catalyst corner of the sea today."

CAT's background proposal for the test, he says. Starting with space former Flying Tiger and an ANG pilot, the airline began developing Cessnas in 1945 when CAT was forced to move out of Madison, Michigan. But the carrier had built up a passenger and cargo business while it still was operating on the mainland.

"We took the usual route a blow when we converted the Cessna on the mainland that an transportation was feasible and economically sound."

J. L. Orlovsky, resident operations director, says "Chinese are not easily sold by propaganda. They have to be shown. One effective method was to buy



Directly the current type
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of the present-day helicopters

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Indiana Gear fabricated this large steel ring gear for the main transmission of a new motor blower shipper without grinding and without heat treatment. Originally the ball-and-socket pinion gear was ground and a necessary other machine was used to produce this part.

It was impossible for the manufacturer to supply fully heat-treated and hardened steel to I.G.W. as required. The steel was hardened after the gear finished manufacturing.

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N2B 1	—	2	1	18	1800
N2B 2	—	2	2	18	1800
N2C 1	—	10-12	1	1800	2800
N2D 1	—	7	1	90-150	1800
N2E	8 watt	20-40	1	1800	3000
N2A	80 watts	40-60	1	1800	3000
N2B	40 watts	30	1	400	1800

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a shipment of machines from a merchant, fly it to destination, sell it and show the merchant the profit that could be made. The Chinese, being white businessmen, soon caught on and their shipments took the full capacity of the airline.

► **Cats and Gals**—It took "fists and gals" for CAT to give support to anti-Communist groups on the involved. Schellhauser says.

Main, CAT transports were performed by bullet holes and engine men landed out by position in the process. But not a single plane was lost to enemy action, Schellhauser reports.

► **Korea Skies**—When war started in Korea, CAT crews flew their planes into enemy military airfields in the cities but more-delivering circumstances, fuel, spare, blood and food to the United Nations troops.

On outboard flights, the airline took aboard wounded soldiers, battle-weary veterans and capable aircraft crew members.

Orlando says no other civilian airline probably has been so closely involved in CAT with active battleships.

► **Film Taking**—CAT chief pilot R. F. Renscher says the airline's pilots are trained "to do anything."

"We indoctrinate them first to be good conventional airline pilots and also competent combat cargo pilots," Renscher says. "We check them out on gun dropping, for instance. And we give good maintenance work."

The chief pilot says CAT's training program is well underway but gun shortages and availability of equipment are making it some extra efforts to advance Chinese captives to capture.

Renscher sums up CAT's operation this way:

"We fly all over the Pacific, make many long overnight legs with a pilot, copilot and a radio operator, using two-engine equipment, yet we never seem to have any trouble."

► **Memorandum**—CAT spokesmen say the airline probably is changing from a cargo carrier to a combined freight-passenger line. Passenger loads have been increasing steadily for the past 15 months, and CAT is changing over from bucket seat planes to "jumbo jets" designed for comfort.

About one-third of CAT's flying is done for the A-1's Far East Command and another third is taken up by non-collective commercial charters according to airline officials.

Characterizing the carrier as "extremely flexible," one official defines CAT's operation as "a non-scheduled operator with usual scheduled appendage" meant to build the airline step-by-step from Bangkok to Korea and to provide Northwest China with a reliable link to other free nations.



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consisting of two ambulances,
ten men, twenty litters
and twenty medical chests...



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NWA Stripping Raises DC-4 Load

Northwest Airlines will soon be able to load an additional 147 lbs into the rear cargo compartments of its fleet of 25 DC-4s. Most of NWA's DC-4s now designed for glider tow operations. By removing only 49 lbs of unneeded glider tow provisions from the plastic tubcases, NWA's gained 147 lbs in capacity because the cargo compartment has a lower maximum gross than the tub case.

FJ-2 Flap Actuator

A new leading flap actuator made by Air Associates, Inc., has successfully passed performance engineering tests for installation in the FJ-2, Navy version of the F-40 Sabre.

The unit can stop the flap in any position within its travel range. Two limit switches in the component provide a high degree of control, according to the firm. The new actuator Model M-5229 is a descendant of the earlier M-5120, used in earlier F-40s.

In the Navy craft, Air Associates expects to supply the complete flap system, which includes two actuators, two double shafts and an H drive.

NEW AVIATION PRODUCTS

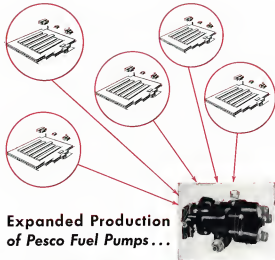


Sabre Dive Relief

Relief valves to prevent fuel tanks in the F-4 Sabre and its Navy counterpart, the FJ-2, from collapsing or being over-pressured are being produced by J. C. Clarke Co.

In the F-46, it is a Fuel Vent Relief No. 7858 with a capacity of 200 cfm airflow. It is actuated by a 1 psi pressure change. The Navy version is called Dive Relief No. 5859. It had a 160 cfm airflow capacity and is triggered by a 2-psi change.

Both valves, designed for 2 in. line size, are normally open. When a side vent is triggered, they close, but are free to return to a predetermined position, even though the internal pressure



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Pesco Products Division, Borg-Warner Corporation, 24700 North Miles Road, Bedford, Ohio

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STANDARD CLAMPS FOR SPECIAL APPLICATIONS

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Polythene molded connectors from England, with drawdown outer case are claimed to have exceptional strength and vibration characteristics despite reduced weight and size. High resistance to mechanical fatigue and dimensional stability have been retained. Connectors are produced in right angle and straight models, making them suitable for confined spaces.

Wang is molded into the plastic.
Pneum. Co., Ltd., Bland, Essex, England.



Gear Output Raised

Higher gear production, greater efficiency and a 300% increase in output life are claimed for new supplemental mechanisms for Red Ring gear shifter mechanisms which permits conversion to a dog-shifting action. The new unit, built on either standard fully automatic Dymco clutch heads and includes the machine.

Versatility of the gear shifter has been increased in the new design, making it in dog-shifting action, and no longer is limited to two strokes but now includes several output strokes, each with its own associated set of gears and shifting strokes. Up load increments can be constant or varied. In cycle of greater number and range of strokes, cycle time is less than in previous models.

National Branch & Machine Co., 5500 St. John Ave., Detroit 13, Mich.

BROOKLYN was "unprintable"

Recently, The Consolidated Edison Company (in New York City) faced this problem: It had to produce a direct-process print from each one of more than ten thousand Brooklyn Underground Record Maps, showing the distribution system of electric service.

But satisfactory prints could not be produced directly from these maps. They were up to 30 years old, had been referred to constantly, and as a result were soiled, stained, creased, and "dog-eared."

What to do? Retinting was out of the question, since it would take a day-and-a-half from two to three days to trace and check just one of these 17" x 25" drawings.

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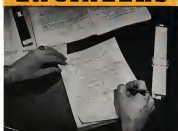
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units have been tested for shocks of 50G and higher.

The 50-amp solenoid is directly interchangeable with current 10- and 25-amp solenoid power only to factory needs. Models of 100, 200 and 350 amp are interchangeable with AN8180 and AN1170 connectors.

Guardian stresses the rugged design of the solenoids, saying they are built to withstand severe punishment while being installed.

Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 11, Ill.

ALSO ON THE MARKET

Tapping blind holes is said to be speeded and simplified with Haptap, a lubricant in solid stick form which is inserted in hole prior to tapping. It prevents use of lubricant at beginning taps or start of operation and cutting to within 1/16ths of the bottom without backing out to remove chips. Instead, these are continuously carried on the lubricant which erodes up along the flutes in the tap and out of the hole under pressure. Dura-Tap Products Co., 1970 W. Grand Blvd., Detroit 2, Mich.

McNister M-58, a cylindrical suspension of submicron dusts in a synthetic fluid, has been developed as an engine bearing protectant additive for four leaf lubricating systems by Alpha Corp., Greenwich, Conn.

Molybdenum based surface paint, reducing the coefficient of friction of molybdenum disulfide as a synthetic fluid, has been developed as an engine bearing protectant additive for four leaf lubricating systems by Alpha Corp., Greenwich, Conn.

Electrode caps could trade as fast with some best input in comparable equipment, with unacoustic case splitters the only disadvantage, according to developer. It may be used on steel, stainless steel, zinc, cast iron, copper and its alloys, and nickel and its alloys with either a.c. or d.c. All-Sonic Welding Alloy Co., Inc., White Plains, N. Y.

Rolling friction that checks size, eccentricity and roll smoothness of cluster gear and smaller parts having integral shafts and centers has been maintained by Mulligan Tool Co., 7771 E. Mc Nichols Rd., Detroit 12, Mich.

Machine handles metal strips, such as wire and strips of material, into compact spirals up to 14 in. in length and diameter for use in loading, ship cargo, and warehousing. Mulvany and Stone Corp., Hollidaysburg, Pa.

A MESSAGE TO AMERICAN INDUSTRY • ONE OF A SERIES

PROSPERITY IN THE USA: How Wealthy Are We?

Again, how prosperous are the people of the United States?

This is the third of a series of messages devoted to this crucially important and much-debated question. The first two messages dealt with what has been happening to our national income, both in terms of its growth and how it is divided among individuals.

This third message deals with what has been happening to the resources—factories, farms, mines, and equipment of all kinds—out of which income is created. It deals with what economists call our wealth.

It is possible for a nation to enjoy apparent prosperity for a time by rapidly exhausting its resources. But to sustain prosperity over the long pull a nation must see that its wealth is not dissipated. Hence what is happening to our wealth now is a harbinger of what is going to happen to our prosperity later on.

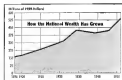
How Wealth is Measured

It is often asserted that the most vital element in a nation's wealth is its people. There is a lot in this idea. For example, the full value of a country's hospital and surgical equipment depends on its physicians and their skill in handling the equipment.

However, no one has ever devised a satisfactory way to put a value on human beings.

So people are omitted from calculations of national wealth. So, too, is military equipment. It is regarded as basically destructive and hence not a real addition to wealth. Otherwise, the wealth of a nation is calculated in terms of the dollar value of its physical resources.

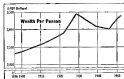
The following chart shows the wealth of the U.S.A. at various intervals during the past 50 years. For the period through 1946 the figures come from a pioneering study by Raymond Goldsmith of the National Bureau of Economic Research, which is widely regarded as the foremost organization in its field. The figures since 1946 are estimated. To remove the effect of price changes, all of the wealth figures are calculated in 1929 prices.



From this chart one fact stands out clearly. It is that since 1929 our national wealth has not been increasing as steadily as it did during

earlier periods. Indeed, in 1946 our total national wealth was actually less than it was in 1929. Only in the last six years have we been able to make any consistent additions.

Even these gains are less impressive when the growth in our population is taken into account, as illustrated by the following chart.



This chart makes it clear that when the nation's wealth is divided by the population, we are slightly worse off per person today than we were in 1929. This is the case in spite of the large additions to our national wealth since 1946.

Depression and war are the two principal reasons we have made no progress in increasing our wealth per person since the 1920s. The depression brought mass unemployment and greatly reduced production which ruled out any increase in wealth. During World War II and again during the post-Korean mobilization program, U.S. production has reached new peaks. But a considerable portion of this record-breaking output has been in the form of military equipment, which is not included in an accounting of national wealth. Consequently, we have been unable to regain the level of wealth per person which we had in 1929.

A Brake of Prosperity

What does this failure to raise our wealth per person mean? It means that we have fewer

resources with which to create income for each individual. It means that we have made no progress in the crucial task of assuring future increases in prosperity.

As the second editorial in this series demonstrated, we have gone so far in equalizing individual incomes that "the possibilities of increasing the income of the rest of the people by 'looting the rich' have largely disappeared." From now on the only promising way to increase our individual incomes is to increase our national earning power.

During the past four years it has taken about \$3.66 of national wealth to yield \$1 of income after taxes. This is a low figure for the wealth needed. Prior to World War II there were long periods when it took at least \$5 of national wealth to produce \$1 of national income. The experts in this field are by no means certain that it will not again take \$5 rather than \$3.66 of wealth to increase income by \$1.

But let us assume that \$3.66 of wealth will suffice to provide \$1 of income in the years ahead. If by 1969—seven years from now—the income of the average American is to be increased from about \$1499, where it stands at present, to \$2000, we must add \$319 billion to the national wealth. This is nearly three times as much as we have added to our wealth since the end of World War II, seven years ago.

Because we have made large additions to our productive equipment in recent years, fears are frequently expressed that we shall soon be plagued by an excess of such equipment. But the facts about our national wealth do not support this conclusion. They indicate that we still have ahead of us a tremendous job of increasing our resources if the American standard of living is again to resume the steady climb which was interrupted by depression and war.

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Positions are available at West Lynn, Mass. and Cincinnati, Ohio. Please do not apply if your best skills are being used for vital defense work. Send your resume to: Technical and Supervisory Personnel, Aircraft Gas Turbine Division, Dept. A.

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TURBOJET ENGINEERS—Focus jet problems at G.E. and the knowledge, creative thinking, and resources of turbojet engineers. Independent thought coupled with past experience produce new and better jet engines.



IN NAVY BLUE—New fighter for the Navy's carrier fleet is the North American F-4 "Phantom." Powered by a new world of the contemporary JET engine, this Navy fighter will be a potent part of America's air arm. Among other planes powered by G-E jets are Boeing's B-47 Strategic Bomber, and North American's F-86 Sabre fighter and F-100 Super Sabre fighter.

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Typical of Ryan's high-temperature development is the new stainless-steel exhaust system for Boeing Stratojets. The first company to put stainless-steel engine parts into production, Ryan has proved they are highly successful in achieving superior and carbon absorption, thereby extending service life. Now stainless-steel parts available for jet engine components too.



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AIR TRANSPORT

Airfreight Carriers Pool Their Problems

- Six lines set up "mutual benefit" transport group.
- Slick Airways president heads new organization.

Leading airfreight carriers last week took first steps toward setting up a new trade association. They plan to take it over next summer for the combined passenger-cargo haul. Air Transport Area, whose members office in business deals of freight carriers.

Representatives of six carriers meeting in Los Angeles appointed an cargo engineer L. R. Hadden of Lockheed Aircraft Co. as executive vice president to head the new airfreight association. And low carriers of this leaders meeting organized funds for the way to organize a staff and headquarters in Washington, starting this week.

Chief aims: "To promote recognition of the independent carrier" and "cutting, bettering and increasing in efficiency for mutual benefit." Name is to be Transport Air Group, signifying that the major aim is to show the world the potential of the air freight industry.

• **Founders:** The founding companies are the two largest combined air freight carriers, Flying Tiger Line and Slick Airways, plus four of the largest non-carrier, unaffiliated airfreight and Pacific north contractors: California Eastern Airways, Overseas National Airways, Seaboard and Western Airlines and Transcon Air Lines.

California Eastern and Seaboard have not yet definitely committed themselves to participate, although they helped to organize the program. They agreed that they probably will join in active support of the association later.

Attending the first Los Angeles or gathering meeting, Slick Airways president Robert W. Peacock, Overseas National president George W. Tompkins, Transcon executive vice-president Sam L. Wilson, California Eastern vice president and general manager Robert E. Conley and Seaboard Pacific manager F. Robert Weaver.

They elected Grace as president, but he told Associates Wire that Hadden will act as chief operating executive

New Airfreight Association

Two domestic combined all freight services and four international combined operations agreed last week to set up a full-scale "Transport Air Group" association in Washington.

- **Existing Tiger Line:** Certified for scheduled service between industrial North, Midwest, Northwest and California, is a Pacific north contractor.
- **Slick Airways:** Certified for scheduled service between industrial North, Midwest, Texas and California.

The four international members: • **California Eastern Airways:** A Pa-

cific north contractor also owns and operates extensive aviation services in the U. S. and was a domestic freight member since 1948.

- **Overseas National Airways:** Pacific north contractor.
- **Seaboard & Western Airlines:** Operates long-haul commercial air freight service between the U. S. to Europe and New York plus Pacific north and other cargo and passenger contracts abroad.
- **Transcon Air Lines:** Offers cargo service in world and serves Pacific north and many named aviation service and maintenance networks in the U. S. and abroad.

of the association. They also elected a tentative slate of directors—president of five of the six founding companies: Grace, Peacock, Tompkins, Samuel J. Solomon of California Eastern and George M. Nelson of Transcon.

• **Organization:** Initial financing of TAG provides for a \$1,000 stock purchase in each member, plus \$100 a month in fee dues. Industry observers expect that additional monthly payments will be provided on a fixed percentage of members' previous transport revenue, the usual formula for association support.

President Thomas L. Grace told Associates Wire that the founders ex-

pect that other independent carriers will cross into the association.

• **Association Program:** The association announcement says it will work full time in the joint interest of its members.

• **Promote recognition of the independent carrier as a "real" instrument to the economic and economic of the U. S.**

• **Provide "better understanding of the business as both industry and freight agencies in providing flexible air charter and all freight air services in both domestic and international operations."**

• **Pool industrial and economic information.**

• **Develop air cargo equipment and planes, as well as successful operating standards and regulations.**

Fulfillment of all these aims entails active cooperation with a number of government agencies in Washington including military, commerce, Civil Aeronautics Board, Civil Aeronautics Administration and Congress, a Washington effort of one of the members and.

Previously, members have been dealing separately, and often ineffectively, these agencies, but Seaboard's Paul says of the better organized Air Transport Area and its members have met the TAG carriers' individual efforts be added.

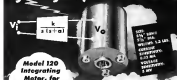
Here are some points cited by a top cargo airline official for activity in the new association through his general agent:

• **As Peace:** Some cargo expense items



L. R. Hadden

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Alaskan Nooked Pushes Court Fight

As Transport America, Inc., Alaska Seaside nooked, has one last chance to get Supreme Court review of the Civil Aeronautics Board decision putting the company out of business for flying into areas then allowed under CAB's economic regulations.

If president Angus Heston, must a review of his case, it was open for two years for federal court study of the Board's power to restrict business volume of airlines on specific routes.

Whether the court review the case depends on possible change of mind by one of the airlines who entered prohibition of a review and decision against Heston's company. It takes a vote of five airlines to bring a case before the court, and three-fifths of those airlines must agree to bring a case. If one airline pulls out, the case is dropped. The court is the last resort for the case.

Still in Business-Minnesota ATA continues its opposition pending the outcome of court action on his petition for rehearing.

"We're still in business," says Heston. "If one more judge believes there is an important enough case, it will bring the court in to hear the case. That's the way it works."

As Transport America claims this case is totally important. Heston says, "For operators in the \$100-million business of regular air transportation, can continue carriage on common commercial carriage if CAB finally were to prohibit court review of its present regulation."

Heston, who also is founder and president of the newly formed Air South Transport Assn., just has challenged the authority of CAB to put an airline out of business without all due process on specific routes, once the Board has granted them operating rights.

U.S. to Aid Italy in Air Traffic Control

Frank J. Monaco of Civil Aeronautics Administration's International Region office in New York leads the seven-man mission which left for Italy Jan. 20 to assist Italian air traffic controllers in modernizing their operations.

Assigned by Charles F. Hume, CAA administrator, in cooperation with the Italian Security Agency, the mission will spend a year in Italy putting into effect American techniques and procedures in air traffic control. With headquarters in Rome, the American mission will concentrate on obtaining standardization in air traffic control at Italian airports.

Other members of the CAA mission: Paul F. Starr, Chicago; Francis E. Fennell and Alfred F. Rizzo of the New York Air Route Traffic Control Center; Peter J. Volpato of the Pittsburgh ARTC; Bernard B. Campagna of the ARTC tower at Hartford; and Bernard J. Root of the Washington ARTC center.

Douglas Reports on Jet Liner Progress

Donald W. Douglas, president of Douglas Aircraft, says his company is making "most satisfactory progress" in developing a jet-powered airliner that will fly faster than 500 mph and carry more than 60 passengers.

He reports that the design is "just too far ahead" when the Douglas jet transport will be flying.

Douglas says he is not excited or not yet by speculation that the American airline industry cannot catch up with

Great Britain in production of commercial jet aircraft.

"When we are ready to deliver jet transports, they will be able to make service as well as headlines," he says. "American-built jet transports today dominate the world because no one has yet produced airplanes that can pass this test for their service."

"One airline operates under a few lines of small type in the special columns of the business page to put its type on the front page."

The seventh airplane accident per jet engine will not be the last to be put to rest.

"When you can get lines more into the air—and that should not be too far away—that will be in terms of more than 500 mph, carry in excess of 60 passengers and be capable of crossing the United States in four hours or less, jet service is as good as commercial jet service," he says.

KLM Traffic Up

(AP Wire Service)

Amsterdam—De Albatros Fliegvier, president of KLM Royal Dutch Airlines, says high-density seating on the carrier's North Atlantic routes largely was responsible for a considerable increase in total passenger traffic last year.

KLM carried 510,000 passengers in 1972, approximately 20,000 more than 1971.

Fliegvier also announced a planned expansion of the KLM fleet this year and during 1974 by purchase of 21 new aircraft, bringing the airline's total to 95 transports of the total of the two-year program.



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America from left to right Louis S. Kelly, American Express Co. president and president of D. Walter Stone, United Air Lines member in the president, the President, and Stuart G. Tipton, ATA general counsel.

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Damon Calls Present Jets Uneconomical

Texas World Airline president Ralph Damon says his carrier has "no present commitments" to buy commercial jet airliners, predicting that it will be impossible for airlines to buy an economically self-sufficient jet transport before 1958.

Damon says he believes de Havilland Comets are not making a profit for air lines despite recent claims by Sir Miles Thomas, president of the British aircraft manufacturing firm.

Thomas' contention that the Comet is making money in operation is "misleading," Damon says, because the de Havilland chief did not make clear that some operational expenses revealed in flying Comets were not included in the profit claims.

Flying Tribesmen

(McGraw-Hill World News)

Johannesburg—Central African tribesmen are taking to the air in large numbers. The competitive African labor recruiting service for South African mines, Witwatersrand Native Labor Association, is running an eight flights weekly service between Johannesburg and the Glenango River in Northern Rhodesia and Lilongwe in northeastern Nyasaland.

El-Al Plans New Fleet

(McGraw-Hill World News)

Tel-Aviv—Israel National Airlines is planning a multi-million-dollar program aimed at putting into the air by 1956 a new fleet made up of jet liners, Lockheed Super Constellation in Douglas DC-4Bs.

An El-Al spokesman says the carrier has asked the Israeli government for a \$5-million loan to finance the program. He predicts the airline will be reduced to a small company flying old aircraft on a charter basis unless the expansion is approved.

New African Airport

(McGraw-Hill World News)

Johannesburg—Proposals are being made for an alternate air carrier airport, probably at Bulima, a mile east of the western shore of Lake Nyasa. The field would complement the present terminal at Chikula, 21 miles from Blantyre in Nyasaland. Contractors of the new terminal would mean that planes from Nairobi and Salisbury could depart with the present practice of carrying large fuel stores for use in the event that the present terminal became congested.

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Mr. Finletter displayed enormous sympathy during his stay at the Pentagon for the American people's right to know more about what their government was up to. He displayed enormous impatience, in his administration proposed, with newspaper secrecy demanded by our former boss of the Air Force.

In the last few months of his administration, Mr. Finletter took over his own press relations, and gave a number of interviews, including one with Miss Katherine Johnson of *American Voice*. He checked the story personally before its publication, and suggested minor revisions, which were made before press time.

During this magazine's experience with a voluntary censorship plan for several months last year as the subject of the great Boeing B-52 jet bomber, Mr. Finletter gave this magazine credit for exerting some beneficial influence on the press generally, by discouraging scoops on the one embargo plan. Mr. Finletter then urged almost curt in discussing publicly. He held to and the close of the experimental period, in the presence of his chief press officer at that time, that he felt our experiment had been a success, and that the nation's press had run up a negligible number of serious violations. But he added, he felt some of *American Voice's* enforced regulations during this experiment had been "too strict," if any criticism could be made at all.

"The job of getting the news out to the people is of the highest importance," Mr. Finletter told his last press conference. "I think there has been a tendency on the part of people in military establishments to hold back news on the shores of security and also because, I suppose, government officials have a congenial tendency that way anyway. I hope you will continue to want it and the more you want it the more it is a pretty safe rule—the better it will be."

Mr. Finletter probably has been kinder with the country's top secrets. He should recognize "serious violations" when he sees them. He should also be capable of assessing the probabilities of change or loss of sight in enlightening the people in individual cases. His vigorous plea for an informed public stands as a bright spot in the drag days of the Truman Administration, which generally held and followed the policies of public secrecy. His plea also is worth the consideration of a new administration as government.

A Sage Decision for Safety

Decision of the Air Force Service to cancel a "B-52" of nearly 300 coast aircraft over the congested streets and highways of the District of Columbia on Independence Day was a sage move, made in the interests of public safety and advancement of aviation.

Equal credit must go to the Aircraft Owners & Pilots

Assoc., which disclosed plans for this potentially hazardous exhibition some two days before the cancellation, and urged that it be drastically revised or canceled.

J. B. Hartsuff, Jr., general manager of AOPA, wrote the Civil Aeronautics Administration that "the effect of a serious accident in the heart of the nation's capital during the inaugural ceremonies, when the entire world will be watching, everything that happens, is so frightening to contemplate that we must request this appeal to you in the interests of all civil aviation."

The Administration had already approved fully the Services' overhead spectacle.

USAF, which was directing arrangements, planned to fly 110 planes, the Hercules 54, the Navy 50, the Army 42, and all four services were to furnish helicopters. Normal and unusual air services in a wide area surrounding Washington would have been paraded or disrupted, on a day when public demand for transportation into and away from Washington would be at a peak. Private pilots were being discouraged from using their planes at all. The hazards of aerial collisions would have been intensified. Hundreds of thousands of visitors to the area would have shared with the million spectators the added hazards from falling aircraft.

Up to a few days before this cancellation, Air Force spokesmen still were protesting that such a fly-by could be conducted with complete safety—a reasonable bit of prophesy—and were using as the questionable basis for this contention the fact that 521 planes had flown over the Tacoma inaugural four years ago without an accident. With such logic as this we could guarantee against any accident today because they happened to be none recorded under similar circumstances.

Fortunately, wiser heads finally prevailed.

Perhaps, at last, we can rest some progress in the light being led by the more thoughtful elements of aviation to improve air safety by keeping late and the law of chance a bit less.

Two Great Records in 1952

Densest concentrated aviation being up an all-time passenger safety record in 1952, equivalent to 38 fatalities for each 100 million passenger-miles. The final figure, expected to be available in a few weeks, may be revised to 37, industry spokesmen indicated to *American Voice*.

Two companies with 1.3 fatalities per 100 million miles in 1952, and 1.1 in 1950.

The millions of the country also set a new all-time passenger safety record in 1952.

According to estimates for the year, based on preliminary reports for 11 months, the Association of American Railroads says there was one passenger fatality for each 2 million 300 million passenger miles. This represents a fatality rate of .045 for each 100 million passenger miles. The association expects the final figures for the year to be "at least this good." This covers operations of the 125 Class 1 railroads, representing 99% of the country's national passenger business, the AAR told *American Voice*.

These are both great records for public safety.

—Robert H. Wood

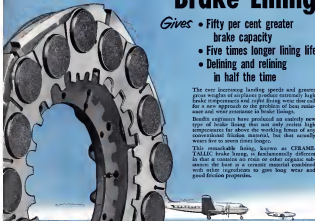
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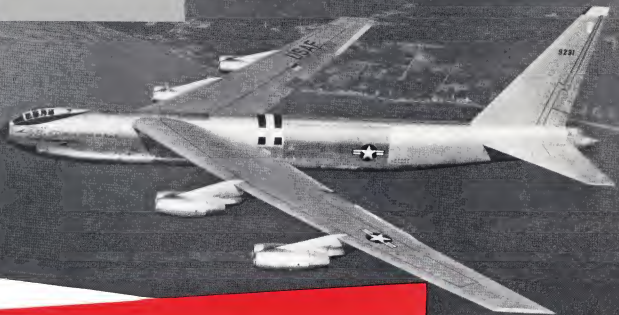
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